

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MB 2,5 C1  
 Edition : 17.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 958  
 Injection pump  
 Pump designation : PES5M55C320RS158-1  
 EP type number : 0 410 055 979  
 Governor  
 Governor design. : RSF340/2300M64-3  
 Governor no. : 0 420 021 101

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM602A

1st version kW : 92.0  
 Rated speed : 4600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)  
 Rack travel in mm : 20.00...22.00

A01

Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

**RATED SPEED**

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,1...8,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

**SET IDLE CONTROL LEVER**

**POSITION**

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

**LOW IDLE 1**

Control lever

position degrees: 8...12

Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.5

Testing:

Speed rpm : 220  
Minimum rack trave: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.50  
Speed rpm : 540...640  
Speed rpm : 1000  
Maximum rack trave: 1.80

SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,20...4,40  
: (4,10...4,50)

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.10  
2nd pressure hPa : 750  
Rack travel in m: 5.80...6.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm3 : 2.50  
1000 s: (3.)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm3/ : 48.5...50.5  
1000 s: (47.5...51.5)

Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 050  
Speed rpm : 1000  
Del.quantity cm3/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm3/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 5.5...6.5  
1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 340  
Rack travel in mm : (12,4...13,8)  
Del.quantity cm3/ : -  
1000 s: (41,0...49,0)  
Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52,0

Remarks:

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ , control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2 \dots 19.8^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.  
Difference in start of delivery between max. and min. value = max.  $1^\circ$  angular displacement of cam

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 F6  
Edition : 17.02.89  
Replaces : 02.06.87  
Test oil : ISO-4113  
Combination no. : 0 400 075 959  
Injection pump  
Pump designation : PES5M55C32ORS166  
EP type number : 0 410 055 980  
Governor  
Governor design. : RSF340/2300M64-1  
Governor no. : 0 420 021 050

Customer-spec. information  
Customer : DB-PKW

Engine : OM602A

1st version kW : 92.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
: (1.65...1.85)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.00...14.10

Del. quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 4.9...5.1

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.8)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del. quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,10...8,50

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER

POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring

Speed rpm : 315  
Rack travel in mm : 5.0

#### Testing:

Speed rpm : 220  
Minimum rack trave: 8.00  
Speed rpm : 315  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.50  
Speed rpm : 525...625  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 1600  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 2200  
Rack travel in m: 12.80...13.00

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.10  
2nd pressure hPa : 750  
Rack travel in m: 5.80...6.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm3 : 2.50  
1000 s: (3.)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm3/ : 48.5...50.5  
1000 s: (47.5...51.5)

Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

1st version  
Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm3/ : 31.0...35.0  
1000 s: (30.0...36.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 4.90...5.10  
Del.quantity cm3/ : 5.0...6.0  
1000 s: (4.0...8.5)  
Spread cm3 : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 340  
Rack travel in mm : (12,4...13,8)  
Del.quantity cm3/ : -  
1000 s: (41,0...49,0)  
Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52,0

#### Remarks:

Pin projection = 16.60...16.70 mm

3.310 V must be attained.

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ , control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$  ( $19.2^\circ \dots 19.8^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.  
Difference in start of delivery between max. and min. value = max.  $1^\circ$  angular displacement of cam

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

#### Testing and adjusting the control-rod-travel sensor with evaluation circuit

##### R2.1.3

##### Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 3.230...3.310 (3.190...3.350) V must be displayed on the digital voltmeter.

#### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 2.095 \dots 2.105$  (2.098...2.102) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 3.230...

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 F  
Edition : 17.02.89  
Replaces : 30.03.87  
Test oil : ISO-4113  
  
Combination no. : 0 400 075 961  
  
Injection pump  
Pump designation : PES5M55C320RS153  
EP type number : 0 410 055 991  
Governor  
Governor design. : RSF350/2300M67  
Governor no. : 0 420 021 094

Customer-spec. information  
Customer : DB

Engine : OM602

1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)

Rack travel in mm : 20.00...22.00  
Firing order : 1-2-4-5-3

A07

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 3.1...3.2

100 s : (3.0...3.3)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 5.7...5.9

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s : (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s : (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,90...8,30

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 0,9...1,0

## LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 350

Rack travel in mm : 5.8

#### Testing:

Speed rpm : 220  
Minimum rack travel: 10.00  
Speed rpm : 350  
Rack travel in mm : 5.70...5.90  
Rack travel in mm : 1.50  
Speed rpm : 640...740  
Speed rpm : 1000  
Maximum rack travel: 1.00

#### SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 4,20...4,40  
                  : (4,10...4,50)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 11.30...11.40  
2nd speed rpm : 1800  
Rack travel in m: 10.80...11.00  
3rd speed rpm : 2200  
Rack travel in m: 10.50...10.70

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 1800  
Del. quantity cm<sup>3</sup>/ : 34.0...35.5  
                  1000 s: (33.0...36.5)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.)  
Speed rpm : 2200  
Del. quantity cm<sup>3</sup>/ : 33.5...35.5  
                  1000 s: (32.5...36.5)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 55.0...0.0  
                  1000 s: (55.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

##### 1st version

Speed rpm : 2500  
Rack travel in mm : 7.90...8.30  
Del. quantity cm<sup>3</sup>/ : 22.0...26.0  
                  1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.00)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.70...5.90  
Del. quantity cm<sup>3</sup>/ : 5.0...6.0  
                  1000 s: (4.5...9.0)  
Spread cm<sup>3</sup> : 1.00  
                  1000 s: (1.50)

#### SETTING PNEUMATIC FAST IDLE (ELA)

Speed rpm : 400  
Rack travel in mm : (5,7...7,3)  
Del. quantity cm<sup>3</sup>/ : (6,0...14,0)  
                  1000 s: -  
Vacuum hPa : 400

#### Remarks:

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 19.3°...19.7°  
(19.2...19.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 350 1/min and pu = 450 mbar  
control rod must move briskly to  
control-rod travel = 0 mm

#### ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At n = 1000 min.

I = 2.5 A, difference in delivery referenced to  
delivery (8.8...10.8) ccm/1000 strokes.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,5 F8  
 Edition : 17.02.89  
 Replaces : 26.08.87  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 974  
 Injection pump  
 Pump designation : PES5M55C32ORS162  
 EP type number : 0 410 055 983  
 Governor  
 Governor design. : RSF340/2300M60-5  
 Governor no. : 0 420 021 063

Customer-spec. information  
 Customer : DB

Engine : OM602-LVP MJ:86  
 1st version kW : 66.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

-1 BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)  
 Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

AD9

Phasing : 0-72-144-216-288  
 Tolerance + - ° : 0.00 (1.00)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 11.30...11.40  
 Del. quantity cm<sup>3</sup>/ : 3.1...3.2  
 100 s : (3.0...3.3)  
 Spread cm<sup>3</sup> : 0.2  
 100 s : (0.3)

2nd speed rpm : 315.0  
 Rack travel in mm : 5.2...5.4  
 Del. quantity cm<sup>3</sup>/ : 0.5...0.6  
 100 s : (0.4...0.9)  
 Spread cm<sup>3</sup> : 0.1  
 100 s : (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Del. quantity : 31.0...32.0  
 1000 : (30.0...33.0)  
 Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 7,1...7,5  
 Speed rpm : 2500  
 4th rack travel in: 2950  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,9...2,0

LOW IDLE 1

Control lever  
 position degrees: 13...17  
 Setting point w/out bumper spring  
 Speed rpm : 315

Rack travel in mm : 5.3

Testing:

Speed rpm : 220  
Minimum rack travel: 7.50  
Speed rpm : 315  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 2.50  
Speed rpm : 530...630  
Speed rpm : 1000  
Maximum rack travel: 2.00

SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 3.90...4.10  
                            : (3,80...4,20)

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 11.30...11.40  
2nd speed rpm : 1600  
Rack travel in m: 10.90...11.10  
3rd speed rpm : 2250  
Rack travel in m: 10.30...10.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 930  
Rack travel mm : 0.10...0.50

Measurement

Speed 1/min : 1000

1st pressure hPa : 840  
Rack travel in m: 1.10...1.30  
2nd pressure hPa : 700  
Rack travel in m: 2.30...2.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1600  
Del.quantity cm3/ : 34.0...35.5  
                    1000 s: (33.0...36.5)  
Spread cm3 : 2.50  
            1000 s: (3.)  
Speed rpm : 2250  
Del.quantity cm3/ : 32.0...34.0  
                    1000 s: (31.0...35.0)  
Spread cm3 : 2.50  
            1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 55.0...0.0  
                    1000 s: (55.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version  
Speed rpm : 2500  
Rack travel in mm : 7.10...7.50  
Del.quantity cm3/ : 16.0...20.0  
                    1000 s: (15.0...21.0)  
Spread cm3 : 2.50  
            1000 s: (3.00)

LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.20...5.40  
Del.quantity cm3/ : 5.0...6.0  
                    1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
            1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12,5...13,9)  
Del.quantity cm3/ : -  
                    1000 s: (33,0...41,0)

Current A : 1,8  
Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current

short-duration A : 3,0

Starting test

Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 55,0

Remarks:

Pin projection = 16.60...16.70 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,  
control-rod travel deduction must be

greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.

With  $n = 315$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 =  $17.3^\circ \dots 17.7^\circ$  ( $17.2 \dots 17.8^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between max. and min. value = max.  $1^\circ$  angular displacement of cam

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 H6  
Edition : 17.02.89  
Replaces : 06.09.88  
Test oil : ISO-4113

Combination no. : 0 400 075 975

Injection pump  
Pump designation : PES5M55C32ORS159  
EP type number : 0 410 055 985  
Governor  
Governor design. : RSF350/2300M56-2  
Governor no. : 0 420 021 055

Customer-spec. information  
Customer : DB

Engine : OM602-LVP

1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.50...1.60  
                  : (1.45...1.65)

Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.50...11.60

Del.quantity cm<sup>3</sup>/ : 3.2...3.3

100 s: (3.1...3.4)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 5.0...5.2

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 32.0...33.0

1000 : (31.0...34.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7.0...7.4

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,9...2,0

## LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 350

Rack travel in mm : 5.1

Testing:

Speed rpm : 220  
Minimum rack travel: 10.00  
Speed rpm : 350  
Rack travel in mm : 5.00...5.20  
Speed rpm : 1000  
Maximum rack travel: 2.00

SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 3.80...4.00  
                          : (3.70...4.10)

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 11.50...11.60  
2nd speed rpm : 1800  
Rack travel in m: 11.00...11.20  
3rd speed rpm : 2250  
Rack travel in m: 10.60...10.80

Aneroid/Altitude Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 930  
Rack travel mm : 0.10...0.50

Measurement

Speed 1/min : 1000

1st pressure hPa : 840  
Rack travel in m: 1.10...1.30  
2nd pressure hPa : 700  
Rack travel in m: 2.30...2.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1800  
Del. quantity cm<sup>3</sup>/ : 35.0...36.5  
                          1000 s: (34.0...37.5)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.)  
Speed rpm : 2250  
Del. quantity cm<sup>3</sup>/ : 33.0...35.0  
                          1000 s: (32.0...36.0)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 52.0...0.0  
                          1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version  
Speed rpm : 2500  
Rack travel in mm : 7.00...7.40  
Del. quantity cm<sup>3</sup>/ : 16.0...20.0  
                          1000 s: (15.0...21.0)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.00...5.20  
Del. quantity cm<sup>3</sup>/ : 5.0...6.0  
                          1000 s: (4.5...9.0)  
Spread cm<sup>3</sup> : 1.00  
                          1000 s: (1.50)

SETTING PNEUMATIC FAST IDLE (ELA)

Speed rpm : 400  
Rack travel in mm : (5,1...6,7)  
Del. quantity cm<sup>3</sup>/ : -  
                          1000 s: (5,0...13,0)  
Vacuum hPa : 400

Remarks:

Pin projection = 16.60...16.70 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 350 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $18.3^{\circ}$ ... $18.7^{\circ}$   
( $18.2$ ... $18.8^{\circ}$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max.  $1^{\circ}$  angular  
displacement of cam



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 H7  
Edition : 17.02.89  
Replaces : 22.04.88  
Test oil : ISO-4113  
  
Combination no. : 0 400 075 977  
  
Injection pump  
Pump designation : PES5M55C320RS159  
EP type number : 0 410 055 985  
Governor  
Governor design. : RSF340/2300M60-1  
Governor no. : 0 420 021 042

Customer-spec. information  
Customer : DB

Engine : OM602-LVP

1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.50...1.60  
: (1.45...1.65)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.50...11.60

Del. quantity cm<sup>3</sup>/ : 3.2...3.3

100 s : (3.1...3.4)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.0...5.2

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s : (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s : (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del. quantity : 32.0...33.0

1000 : (31.0...34.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7.0...7.4

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,9...2,0

## LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 315

Rack travel in mm : 5.1

Testing:

Speed rpm : 220  
Minimum rack trave: 7.50  
Speed rpm : 315  
Rack travel in mm : 5.00...5.20  
Speed rpm : 1000  
Maximum rack trave: 2.00

SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 3,80...4,00  
: (3,70...4,10)

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 11.50...11.60  
2nd speed rpm : 1800  
Rack travel in m: 11.00...11.20  
3rd speed rpm : 2250  
Rack travel in m: 10.60...10.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 930  
Rack travel mm : 0.10...0.50

Measurement

Speed 1/min : 1000

1st pressure hPa : 840  
Rack travel in m: 1.10...1.30  
2nd pressure hPa : 700  
Rack travel in m: 2.30...2.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1800  
Del.quantity cm3/ : 35.0...36.5  
1000 s: (34.0...37.5)  
Spread cm3 : 2.50  
1000 s: (3.)  
Speed rpm : 2250  
Del.quantity cm3/ : 33.0...35.0  
1000 s: (32.0...36.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version

Speed rpm : 2500  
Rack travel in mm : 7.00...7.40  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (15.0...21.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.00...5.20  
Del.quantity cm3/ : 5.0...6.0  
1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12,5...13,9)  
Del.quantity cm3/ : -  
1000 s: (32,0...40,0)

Current A : 1,8  
Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current

short-duration A : 3,0

Starting test

Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52,0

Remarks:

Pin projection = 16.60...16.70 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).



Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $18.3^{\circ} \dots 18.7^{\circ}$   
( $18.2 \dots 18.8^{\circ}$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max.  $1^{\circ}$  angular  
displacement of cam

TESTING PNEUMATIC SHUTOFF DEVICE  
-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 D  
Edition : 08.03.89  
Replaces : 04.86  
Test oil : ISO-4113  
  
Combination no. : 0 400 075 979  
  
Injection pump  
Pump designation : PES5M55C320RS153  
EP type number : 0 410 055 991  
Governor  
Governor design. : RSF340/2300M59-8  
Governor no. : 0 420 021 051

Customer-spec. information  
Customer : DB

Engine : OM602

1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 3.1...3.2

100 s : (3.0...3.3)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s : (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s : (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,8...8,2

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0,0...1,0

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 0,9...1,0

## LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 315

Rack travel in mm : 5.5

Testing:

Speed rpm : 220  
Minimum rack travel: 8.00  
Speed rpm : 380  
Rack travel in mm : 4.20...4.40  
Rack travel in mm : 1.50  
Speed rpm : 630...730  
Speed rpm : 1000  
Maximum rack travel: 1.00

SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,20...4,40  
  : (4,10...4,50)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in mm : 11.30...11.40  
2nd speed rpm : 1800  
Rack travel in mm : 10.90...11.10  
3rd speed rpm : 2200  
Rack travel in mm : 10.60...10.80

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1800  
Del.quantity cm<sup>3</sup>/ : 34.0...35.5  
1000 s : (33.0...36.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s : (3.00)  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 33.5...35.5  
1000 s : (32.5...36.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s : 3.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
1000 s : 55,0  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version

Speed rpm : 2500  
Rack travel in mm : 7.80...8.20  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000 s : (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s : (3.00)

LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
1000 s : (4.5...9.0)  
Spread cm<sup>3</sup> : 1.00  
1000 s : (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 340  
Rack travel in mm : (12,6...14,0)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s : (33,0...41,0)

Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s : 55,0

Remarks:

:

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With n = 315 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 C  
Edition : 17.02.89  
Replaces : 04.86  
Test oil : ISO-4113  
  
Combination no. : 0 400 075 980  
  
Injection pump  
Pump designation : PES5M55C32ORS158  
EP type number : 0 410 055 986  
Governor  
Governor design. : RSF340/2300M64-1  
Governor no. : 0 420 021 050

Customer-spec. information  
Customer : DB

Engine : OM602A

1st version kW : 92.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

A20

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,1...8,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER

### POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

## LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring

Speed rpm : 315  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 220  
Minimum rack trave: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.50  
Speed rpm : 540...640  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,2...4,4  
: (4,1...4,5)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.10  
2nd pressure hPa : 750  
Rack travel in m: 5.80...6.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm3/ : 48.5...50.5  
1000 s: (47.5...51.5)

Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm3/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 5.5...6.5  
1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12,4...13,8  
Del.quantity cm3/ : -  
1000 s: (41,0...49,0)

Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current

short-duration A : 3,0

#### Starting test

Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52,0

Remarks:

#### CHECKING THE IDLE-SPEED AUXILIARY

### SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2 \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Testing and adjusting the control-rod-  
travel sensor with evaluation circuit  
R2.1.3

#### Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 3.230...3.310  
(3.190...3.350) V must be displayed  
on the digital voltmeter.

#### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel  
delivery at 23.0...24.0 (22.0...25.0)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
 $U = 2.095 \dots 2.105$  (2.098...2.102) V is  
indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-  
load stop; voltage value of 3.230...  
3.310 V must be attained.

Pin projection = 16.60...16.70 mm

### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction

screw on ALDA pressure box.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 E  
Edition : 17.02.89  
Replaces : 04.86  
Test oil : ISO-4113  
Combination no. : 0 400 075 982  
Injection pump  
Pump designation : PES5M55C320RS153  
EP type number : 0 410 055 991  
Governor  
Governor design. : RSF340/2300M59-4  
Governor no. : 0 420 021 043

Customer-spec. information  
Customer : DB

Engine : OM602

1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del. quantity cm<sup>3</sup>/ : 3.1...3.2

100 s : (3.0...3.3)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.4...5.6

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s : (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s : (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del. quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,8...8,2

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 0,9...1,0

## LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 315

Rack travel in mm : 5.5

Testing:

Speed rpm : 220  
Minimum rack trave: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 1.50  
Speed rpm : 630...730  
Speed rpm : 1000  
Maximum rack trave: 1.00

SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4.20...4.40  
: (4,10...4,50)

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 11.30...11.40  
2nd speed rpm : 1800  
Rack travel in m: 10.90...11.10  
3rd speed rpm : 2200  
Rack travel in m: 10.60...10.80

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1800  
Del.quantity cm3/ : 34.0...35.5  
1000 s: (33.0...36.5)  
Spread cm3 : 2.50  
1000 s: (3.00)  
Speed rpm : 2200  
Del.quantity cm3/ : 33.5...35.5  
1000 s: (32.5...36.5)  
Spread cm3 : 2.50  
1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 55.0...0.0  
1000 s: (55.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version

Speed rpm : 2500  
Rack travel in mm : 7.80...8.20  
Del.quantity cm3/ : 22.0...26.0  
1000 s: (21.0...27.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 5.0...6.0  
1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12,6...14,0)  
Del.quantity cm3/ : -  
1000 s: (33,0...41,0)

Current A

: 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current

short-duration A : 3,0

Starting test

Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 55,0

Remarks:

:

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With n = 315 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 19.3°...19.7°

(19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 A  
Edition : 17.02.89  
Replaces : 12.85  
Test oil : ISO-4113  
  
Combination no. : 0 400 075 986  
  
Injection pump  
Pump designation : PES5M55C32ORS153  
EP type number : 0 410 055 991  
Governor  
Governor design. : RSF350/2300M55-3  
Governor no. : 0 420 021 041

Customer-spec. information  
Customer : DB

Engine : OM602

1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)

Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,8...8,2

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 0,9...1,0

## LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 350

Rack travel in mm : 5.5

Testing:

Speed rpm : 220  
Minimum rack travel: 10.00  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 1.50  
Speed rpm : 640...740  
Speed rpm : 1000  
Maximum rack travel: 1.00

SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 4,20...4,40  
                          : (4,10...4,50)

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 11.30...11.40  
2nd speed rpm : 1800  
Rack travel in m: 10.90...11.10  
3rd speed rpm : 2200  
Rack travel in m: 10.60...10.80

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1800  
Del.quantity cm<sup>3</sup>/ : 34.0...35.5  
                  1000 s: (33.0...36.5)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.00)  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 33.5...35.5  
                  1000 s: (32.5...36.5)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 55.0...0.0  
                  1000 s: (55.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version

Speed rpm : 2500  
Rack travel in mm : 7.80...8.20  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
                  1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.00)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
                  1000 s: (4.5...9.0)  
Spread cm<sup>3</sup> : 1.00  
                  1000 s: (1.50)

SETTING PNEUMATIC FAST IDLE  
(ELA)

Speed rpm : 400  
Rack travel in mm : (5,2...6,8)  
Del.quantity cm<sup>3</sup>/ : -  
                  1000 s: (5,0...13,0)  
Vacuum hPa : 400

Remarks:

:

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 350 1/min and pu = 450 mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 19.3°...19.7°  
(19.2...19.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 01  
 Edition : 17.02.89  
 Replaces : 12.85  
 Test oil : ISO-4113

Combination no. : 0 400 075 991

Injection pump  
 Pump designation : PES5M55C320RS108-1  
 EP type number : 0 410 055 992  
 Governor  
 Governor design. : RSF350/2300M15  
 Governor no. : 0 420 021 014

Customer-spec. information  
 Customer : DB

Engine : OM617 (3.0 L)

1st version kW : 65.0

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 012

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 20.00...0.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.40...13.50

Del.quantity cm<sup>3</sup>/ : 3.9...4.0

100 s: (3.8...4.1)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.2

Del.quantity cm<sup>3</sup>/ : 0.6...0.7

100 s: (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Del.quantity : 39.0...40.0

1000 : (38.0...41.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

### Testing:

1st rack travel in: 9.00

Speed rpm : 0...2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

## LOW IDLE 1

Control lever

position degrees: 9...13

Setting point w/out bumper spring

Speed rpm : 350

Rack travel in mm : 6.1

Testing:

Speed rpm : 250  
Minimum rack travel: 10.00  
Speed rpm : 350  
Rack travel in mm : 6.00...6.20  
Rack travel in mm : 2.00  
Speed rpm : 720...820  
Speed rpm : 300  
Maximum rack travel: 9.50

SET IDLE AUXILIARY SPRING

Speed rpm : 450  
Rack travel in mm : 4,60...4,80  
: (4,50...4,90)

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.40...13.50  
2nd speed rpm : 1800  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 2200  
Rack travel in m: 12.50...12.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1800  
Del.quantity cm3/ : 39.0...41.0  
1000 s: (38.0...42.0)  
Spread cm3 : 2.50  
1000 s: (3.00)  
Speed rpm : 2200  
Del.quantity cm3/ : 39.5...41.5  
1000 s: (38.5...42.5)  
Spread cm3 : 2.50  
1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 53.0...0.0  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version

Speed rpm : 2500  
Rack travel in mm : 8.60...9.00  
Del.quantity cm3/ : 23.0...27.0  
1000 s: (22.0...28.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.00...6.20  
Del.quantity cm3/ : 6.0...7.0  
1000 s: (5.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

Remarks:

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 47°. No change in control-rod travel after switchover point up to 550 1/min, control-lever position 30°. Speed range 350 1/min...450 1/min.

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop. With n = 375 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W25  
 Edition : 17.02.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 400 076 967

Injection pump  
 Pump designation : PES6M55C32ORS171-1  
 EP type number : 0 410 056 987  
 Governor  
 Governor design. : RSF315/2300M60-8  
 Governor no. : 0 420 021 114

Customer-spec. information  
 Customer : DB-PKW

Engine : OM603-ECE

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.00 (1.00)  
 Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

---

Rack travel in mm : 12.50...12.60

---

Del.quantity cm<sup>3</sup>/ : 3.1...3.2  
 100 s: (3.0...3.3)

Spread cm<sup>3</sup> : 0.2  
 100 s: (0.3)

2nd speed rpm : 290.0  
 Rack travel in mm : 7.1...7.3  
 Del.quantity cm<sup>3</sup>/ : 0.5...0.6  
 100 s: (0.5...0.9)  
 Spread cm<sup>3</sup> : 0.1  
 100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1100  
 Del.quantity : 31.0...32.0  
 1000 : (30.0...33.0)  
 Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 9,0...9,4  
 Speed rpm : 2500  
 4th rack travel in: 2950  
 Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,7...1,8

LOW IDLE 1  
 Control lever  
 position degrees: 12...16  
 Setting point w/out bumper spring

Speed rpm : 290  
Rack travel in mm : 7.2

Testing:

Speed rpm : 220  
Minimum rack trave: 9.00  
Speed rpm : 290  
Rack travel in mm : 7.10...7.30  
Rack travel in mm : 2.50  
Speed rpm : 600...700  
Speed rpm : 1000  
Maximum rack trave: 1.80

SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 5,50...5,70  
                                : (5,40...5,80)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
    Rack travel in m: 12.50...12.60  
2nd speed rpm : 1400  
    Rack travel in m: 12.30...12.50  
3rd speed rpm : 2200  
    Rack travel in m: 11.90...12.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

Measurement  
Speed 1/min : 1000

1st pressure hPa : 900  
    Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
    Rack travel in m: 1.80...2.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1100  
Speed rpm : 1400  
Del.quantity cm3/ : 31.0...32.5  
    1000 s: (30.0...33.5)  
Spread cm3 : 2.50  
    1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 2200  
Del.quantity cm3/ : 33.5...35.5  
    1000 s: (32.5...36.5)

Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
    1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version  
Aneroid pressure h: 1100  
Speed rpm : 2500  
Rack travel in mm : 9.00...9.40  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
    1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
    1000 s: (3.00)

LOW IDLE

Speed rpm : 290  
Rack travel in mm : 7.10...7.30  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
    1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
    1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 315  
Rack travel in mm : (12,5...13,9)  
Del.quantity cm<sup>3</sup>/ : -  
    1000 s: (27,0...35,0)

Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current  
    short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52,0

Remarks:

:  
Pin projection = 16.60...16.70 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction

allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2^\circ \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 3,0 W26  
 Edition : 17.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 076 969  
 Injection pump  
 Pump designation : PES6M55C32ORS174  
 EP type number : 0 410 056 988  
 Governor  
 Governor design. : RSF315/2300M72-2  
 Governor no. : 0 420 021 121

Customer-spec. information  
 Customer : DB

Engine : OM603-Abgasl.

1st version kW : 76.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.40...12.50

Del.quantity cm<sup>3</sup>/ : 3.1...3.2

100 s : (3.0...3.3)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 300.0

Rack travel in mm : 7.0...7.2

Del.quantity cm<sup>3</sup>/ : 0.6...0.7

100 s : (0.6...1.0)

Spread cm<sup>3</sup> : 0.1

100 s : (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h : 1100

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 9,1...9,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER

POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring



Speed rpm : 300  
Rack travel in mm : 7.1

Testing:

Speed rpm : 220  
Minimum rack travel: 7.00  
Speed rpm : 300  
Rack travel in mm : 7.00...7.20  
Rack travel in mm : 2.50  
Speed rpm : 600...700  
Speed rpm : 1000  
Maximum rack travel: 1.50

SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 5,30...5,50  
                  : (5,20...5,60)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.40...12.50  
2nd speed rpm : 1800  
Rack travel in m: 11.80...12.00  
3rd speed rpm : 2200  
Rack travel in m: 11.50...11.70

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

Measurement

Speed 1/min : 1000

1st pressure hPa : 900  
Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in m: 1.80...2.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1100  
Speed rpm : 1800  
Del.quantity cm<sup>3</sup>/ : 34.5...36.0  
                  1000 s: (33.5...37.0)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 33.0...35.0  
                  1000 s: (32.0...36.0)

Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
                  1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version  
Aneroid pressure h: 1100  
Speed rpm : 2500  
Rack travel in mm : 9.10...9.50  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
                  1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.00)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.00...7.20  
Del.quantity cm<sup>3</sup>/ : 6.5...7.5  
                  1000 s: (6.0...10.5)  
Spread cm<sup>3</sup> : 1.00  
                  1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 315  
Rack travel in mm : (12,9...14,3)  
Del.quantity cm<sup>3</sup>/ : -  
                  1000 s: (28,0...36,0)

Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52,0

Remarks:

Pin projection = 16.60...16.70 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction

allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 300$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

#### START-OF-DELIVERY ADJUSTMENT

-Start-of delivery adjustment and lock  
after start-of-delivery mean value of  
all cylinders,  $16.3...16.7^\circ$   
( $16.2...16.8^\circ$ ) angular displacement of  
the cam after cylinder 1.

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

#### ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At  $n = 1000$  min.  $-1$ ,  
 $I = 2.5$  A, difference in delivery referenced to full-load  
delivery (7.7...9.9) ccm/1000 strokes.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W22  
Edition : 17.02.89  
Replaces : 19.08.88  
Test oil : ISO-4113  
Combination no. : 0 400 076 970  
Injection pump  
Pump designation : PES6M55C320RS174  
EP type number : 0 410 056 988  
Governor  
Governor design. : RSF315/2300M60-21  
Governor no. : 0 420 021 122

Customer-spec. information  
Customer : DB

Engine : OM603-Abgasl.

1st version kW : 76.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
: (1.65...1.85)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.40...12.50

Del. quantity cm<sup>3</sup>/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 6.6...6.8

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del. quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 9,1...9,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

## LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

Speed rpm : 290  
Rack travel in mm : 6.7

Testing:

Speed rpm : 220  
Minimum rack travel: 7.00  
Speed rpm : 290  
Rack travel in mm : 6.60...6.80  
Rack travel in mm : 2.50  
Speed rpm : 570...670  
Speed rpm : 1000  
Maximum rack travel: 1.50

SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 5.20...5.40  
: (5,10...5,50)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.40...12.50  
2nd speed rpm : 1800  
Rack travel in m: 11.80...12.00  
3rd speed rpm : 2200  
Rack travel in m: 11.50...11.70

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

Measurement

Speed 1/min : 1000

1st pressure hPa : 900  
Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in m: 1.80...2.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1100  
Speed rpm : 1800  
Del.quantity cm<sup>3</sup>/ : 34.5...36.0  
1000 s: (33.5...37.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 33.0...35.0  
1000 s: (32.0...36.0)

Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version  
Aneroid pressure h: 1100  
Speed rpm : 2500  
Rack travel in mm : 9.10...9.50  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

LOW IDLE

Speed rpm : 290  
Rack travel in mm : 6.60...6.80  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 315  
Rack travel in mm : (12,8...14,2)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (28,0...36,0)

Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current

short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52,0

Remarks:

Pin projection = 16.60...16.70 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction

allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

START-OF-DELIVERY ADJUSTMENT  
-Start-of delivery adjustment and lock  
after start-of-delivery mean value of  
all cylinders,  $16.3...16.7^\circ$   
( $16.2...16.8^\circ$ ) angular displacement of  
the cam after cylinder 1.

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 3,0 W23  
 Edition : 17.02.89  
 Replaces : 05.08.88  
 Test oil : ISO-4113  
 Combination no. : 0 400 076 971  
 Injection pump  
 Pump designation : PES6M55C32ORS171  
 EP type number : 0 410 056 989  
 Governor  
 Governor design. : RSF315/2300M60-8  
 Governor no. : 0 420 021 114

Customer-spec. information  
 Customer : DB

Engine : OM603-ECE

1st version kW : 80.0

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

B10

Phasing : 0-60-120-180-240-300°

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm<sup>3</sup>/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 7.1...7.3

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 31.0...32.0

1000 : (30.0...33.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

**RATED SPEED**

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 9,0...9,4

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

**SET IDLE CONTROL LEVER  
 POSITION**

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

Speed rpm : 290  
Rack travel in mm : 7.2

Testing:

Speed rpm : 220  
Minimum rack travel : 9.00  
Speed rpm : 290  
Rack travel in mm : 7.10...7.30  
Rack travel in mm : 2.50  
Speed rpm : 600...700  
Speed rpm : 1000  
Maximum rack travel : 1.80

SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 5.50...5.70  
: (5,40...5,80)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 1400  
Rack travel in m: 12.30...12.50  
3rd speed rpm : 2200  
Rack travel in m: 11.90...12.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

Measurement

Speed 1/min : 1000

1st pressure hPa : 900  
Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in m: 1.80...2.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1100  
Speed rpm : 1400  
Del.quantity cm3/ : 31.0...32.5  
1000 s: (30.0...33.5)  
Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 2200  
Del.quantity cm3/ : 33.5...35.5  
1000 s: (32.5...36.5)

Spread cm3 : 2.50  
1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version  
Aneroid pressure h: 1100  
Speed rpm : 2500  
Rack travel in mm : 9.00...9.40  
Del.quantity cm3/ : 22.0...26.0  
1000 s: (21.0...27.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

LOW IDLE

Speed rpm : 290  
Rack travel in mm : 7.10...7.30  
Del.quantity cm3/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm3 : 1.00  
1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 315  
Rack travel in mm : (12,5...13,9)  
Del.quantity cm3/ : -  
1000 s: (27,0...35,0)

Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0

Current short-duration A : 3,0

Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52,0

Remarks:

Pin projection = 16.60...16.70 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction

allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
 $KDEP 1077 = 19.3^\circ \dots 19.7^\circ$   
( $19.2^\circ \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 3,0 W24
Edition : 17.02.89
Replaces : 19.08.88
Test oil : ISO-4113
Combination no. : 0 400 076 972
Injection pump
Pump designation : PES6M55C320RS171
EP type number : 0 410 056 989
Governor
Governor design. : RSF315/2300M72-1
Governor no. : 0 420 021 115

Customer-spec. information
Customer : DB

Engine : OM603-ECE

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
: (1.95...2.15)
Rack travel in mm : 20.00...22.00
Firing order : 1- 5- 3- 6- 2- 4

B13

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 300.0

Rack travel in mm : 7.3...7.5

Del.quantity cm3/ : 0.6...0.7

100 s: (0.6...1.0)

Spread cm3 : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 31.0...32.0

1000 : (30.0...33.0)

Spread cm3 : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 9,0...9,4

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER
POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

Speed rpm : 300  
Rack travel in mm : 7.4

#### Testing:

Speed rpm : 220  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.50  
Speed rpm : 620...720  
Speed rpm : 1000  
Maximum rack travel: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 5,80...6,00  
                                  : (5,70...6,10)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 1400  
Rack travel in m: 12.30...12.50  
3rd speed rpm : 2200  
Rack travel in m: 11.90...12.10

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

Measurement  
Speed 1/min : 1000

1st pressure hPa : 900  
Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in m: 1.80...2.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1400  
Del.quantity cm<sup>3</sup>/ : 31.0...32.5  
                          1000 s: (30.0...33.5)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 33.5...35.5  
                          1000 s: (32.5...36.5)

Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
                          1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

1st version  
Aneroid pressure h: 1100  
Speed rpm : 2500  
Rack travel in mm : 9.00...9.40  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
                          1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.30...7.50  
Del.quantity cm<sup>3</sup>/ : 6.5...7.5  
                          1000 s: (6.0...10.5)  
Spread cm<sup>3</sup> : 1.00  
                          1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 315  
Rack travel in mm : (12,5...13,9  
Del.quantity cm<sup>3</sup>/ : -  
                          1000 s: (27,0...35,0)

Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52,0

#### Remarks:

Pin projection = 16.60...16.70 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction

allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 300$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2 \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

#### ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At  $n = 1000$  min.  $-1$ ,  
 $I = 2.5$  A, difference in delivery referenced to full-load  
delivery (9.0...11.0) ccm/1000 strokes.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W20  
 Edition : 17.02.89  
 Replaces : 06.09.88  
 Test oil : ISO-4113  
 Combination no. : 0 400 076 973  
 Injection pump  
 Pump designation : PES6M55C320RS165  
 EP type number : 0 410 056 990  
 Governor  
 Governor design. : RSF315/2300M66-2  
 Governor no. : 0 420 021 099

Customer-spec. information  
 Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del. quantity cm<sup>3</sup>/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...5.8

Del. quantity cm<sup>3</sup>/ : 0.6...0.7

100 s: (0.6...1.0)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del. quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7.8...8,2

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 0,9...1,0

## LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 5.7

Testing:

Speed rpm : 220  
Minimum rack travel: 7.00  
Speed rpm : 300  
Rack travel in mm : 5.60...5.80  
Rack travel in mm : 1.50  
Speed rpm : 620...720  
Speed rpm : 1000  
Maximum rack travel: 1.00

SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 4.20...4.40  
                      : (4,10...4,50)

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 11.30...11.40  
2nd speed rpm : 1800  
Rack travel in m: 10.90...11.10  
3rd speed rpm : 2200  
Rack travel in m: 10.60...10.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 930  
Rack travel mm : 0.10...0.50

Measurement

Speed 1/min : 1000

1st pressure hPa : 840  
Rack travel in m: 1.10...1.30  
2nd pressure hPa : 700  
Rack travel in m: 2.30...2.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1800  
Del.quantity cm<sup>3</sup>/ : 34.0...35.5  
1000 s: (33.0...36.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 33.5...35.5  
1000 s: (32.5...36.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 55.0...0.0  
1000 s: (55.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version

Speed rpm : 2500  
Rack travel in mm : 7.80...8.20  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 6.5...7.5  
1000 s: (6.0...10.0)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop

Speed rpm : 315  
Rack travel in mm : (12,6...14,0)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (32,0...40,0)

Current A : 1,8

Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0,0...1,0

Current

short-duration A : 3,0

Starting test

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 55,0

Remarks:

:

Pin projection = 16.60...16.70 mm

Start-of-delivery sensor system:  
adjustment and blocking with device

KDEP 1077 = 19.3°...19.7°  
(19.2...19.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max. 1° angular

displacement of cam

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF  
-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

ADJUSTING ACTIVE JOLT DAMPING (ARD)  
Control lever at full-load stop. With  
 $n = 1000$  1/min.,  $I = 2.5$  A, control-rod-  
travel reduction = 2.25...2.55 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W10  
Edition : 17.02.89  
Replaces : 30.03.87  
Test oil : ISO-4113  
  
Combination no. : 0 400 076 975  
  
Injection pump  
Pump designation : PES6M55C32ORS156  
EP type number : 0 410 056 995  
Governor  
Governor design. : RSF315/2300M66  
Governor no. : 0 420 021 066

Customer-spec. information  
Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.60)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del. quantity cm<sup>3</sup>/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.3

Del. quantity cm<sup>3</sup>/ : 0.6...0.7

100 s: (0.6...1.0)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Del. quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,9...9,3

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 0,9...1,0

## LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.2

Testing:

Speed rpm : 220  
Minimum rack travel: 7.00  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Rack travel in mm : 1.50  
Speed rpm : 600...700  
Speed rpm : 1000  
Maximum rack travel: 1.00

SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 4,20...4,40  
                                  : (4,10...4,50)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in mm : 11.30...11.40  
2nd speed rpm : 1800  
Rack travel in mm : 10.80...11.00  
3rd speed rpm : 2200  
Rack travel in mm : 10.50...10.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1800  
Del.quantity cm<sup>3</sup>/ : 34.0...35.5  
                          1000 s: (33.0...36.5)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 33.5...35.5  
                          1000 s: (32.5...36.5)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 55.0...0.0  
                          1000 s: (55.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version

Speed rpm : 2500  
Rack travel in mm : 7.90...8.30  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
                          1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Del.quantity cm<sup>3</sup>/ : 6.5...7.5  
                          1000 s: (6.0...10.0)  
Spread cm<sup>3</sup> : 1.00  
                          1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 315  
Rack travel in mm : (12,0...13,4)  
Del.quantity cm<sup>3</sup>/ : -  
                          1000 s: (30,0...38,0)  
Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 55,0

Remarks:

:

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

Start-of-delivery sensor system:

adjustment and blocking with device  
KDEP 1077 = 19.3°...19.7°  
(19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.  
Difference in start of delivery between max. and min. value = max. 1° angular



displacement of cam

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At  $n = 1000$  min.  $-1$   
 $I = 2.5$  A, difference in delivery referenced to full-load  
delivery (8.8...10.8) ccm/1000 strokes.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W21  
Edition : 17.02.89  
Replaces : 06.09.88  
Test oil : ISO-4113  
  
Combination no. : 0 400 076 976  
  
Injection pump  
Pump designation : PES6M55C32ORS157-1  
EP type number : 0 410 056 991  
Governor  
Governor design. : RSF450/2300M68  
Governor no. : 0 420 021 095

Customer-spec. information  
Customer : DB

Engine : OM603A (3.0L)

1st version kW : 100.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.10...13.20

Del. quantity cm<sup>3</sup>/ : 4.6...4.7

100 s: (4.5...4.8)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 450.0

Rack travel in mm : 5.4...5.6

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del. quantity : 46.5...47.5

1000 : (45.5...48.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

#### Control lever

position degrees: 50...0

3rd rack travel in: 8,5...8,9

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER

### POSITION

Speed rpm : 1000

Rack travel in mm : 1,9...2,0

## LOW IDLE 1

### Control lever

position degrees: 10...14

Setting point w/out bumper spring

Speed rpm : 450  
Rack travel in mm : 5.5

Testing:

Speed rpm : 250  
Minimum rack trave: 13.00  
Speed rpm : 450  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.50  
Speed rpm : 620...720  
Speed rpm : 1000  
Maximum rack trave: 2.00

SET IDLE AUXILIARY SPRING

Speed rpm : 500  
Rack travel in mm : 4,30...4,50  
                                : (4,20...4,60)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.10...13.20  
2nd speed rpm : 1600  
Rack travel in m: 12.40...12.60  
3rd speed rpm : 2200  
Rack travel in m: 11.50...11.70

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1500  
Rack travel mm : 0.00...0.40

Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 2.70...2.90  
2nd pressure hPa : 750  
Rack travel in m: 4.40...4.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 45.5...47.0  
1000 s: (44.5...48.0)  
Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm3/ : 44.0...46.0  
1000 s: (43.0...47.0)

Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 34.0...35.0  
1000 s: (33.0...36.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version  
Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.50...8.90  
Del.quantity cm3/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

LOW IDLE

Speed rpm : 450  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm3 : 1.00  
1000 s: (1.50)

SETTING PNUEUMATIC FAST IDLE  
(ELA)

Speed rpm : 500  
Rack travel in mm : (6,8...8,4)  
Del.quantity cm3/ : -  
1000 s: (14,0...22,0)  
Vacuum hPa : 600

Remarks:

Pin projection = 16.60...16.70 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,

control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

Start-of-delivery sensor system:  
adjustment and blocking with device KDEP 1077 =  $19.3^{\circ} \dots 19.7^{\circ}$   
( $19.2 \dots 19.8^{\circ}$ ) angular displacement of cam following start of delivery of cylinder no. 1.  
Difference in start of delivery between max. and min. value = max.  $1^{\circ}$  angular displacement of cam

CORRECTION OF INJECTED-FUEL QUANTITY  
-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W19  
Edition : 17.02.89  
Replaces : 06.09.88  
Test oil : ISO-4113

Combination no. : 0 400 076 977

Injection pump  
Pump designation : PES6M55C320RS165  
EP type number : 0 410 056 990  
Governor  
Governor design. : RSF315/2300M60-7  
Governor no. : 0 420 021 092

Customer-spec. information  
Customer : DB

Engine : OM603-3.0; MJ:88

1st version kW : 75.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.70...12.80

Del.quantity cm<sup>3</sup>/ : 3.0...3.1

100 s: (2.9...3.2)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 6.9...7.1

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 800

Aneroid pressure h: 1100

Del.quantity : 30.5...31.5

1000 : (29.5...32.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

#### Control lever

position degrees: 0...50

3rd rack travel in: 9,2...9,6

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER

### POSITION

Speed rpm : 1000

Rack travel in mm : 1,9...2,0

## LOW IDLE 1

### Control lever

position degrees: 10...14

Setting point w/out bumper spring

Speed rpm : 290  
Rack travel in mm : 7.0

#### Testing:

Speed rpm : 220  
Minimum rack travel : 7.00  
Speed rpm : 290  
Rack travel in mm : 6.90...7.10  
Rack travel in mm : 2.50  
Speed rpm : 630...730  
Speed rpm : 800  
Maximum rack travel : 2.00

#### SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 5,50...5,70  
                              : (5,40...5,80)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 800  
Rack travel in mm : 12.70...12.80  
2nd speed rpm : 1600  
Rack travel in mm : 12.00...12.20  
3rd speed rpm : 2200  
Rack travel in mm : 11.40...11.60

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 800  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

Measurement  
Speed 1/min : 800

1st pressure hPa : 900  
Rack travel in mm : 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in mm : 1.80...2.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 31.5...33.0  
                              1000 s: (30.5...34.0)  
Spread cm<sup>3</sup> : 2.50  
                              1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 32.0...34.0  
                              1000 s: (31.0...35.0)

Spread cm<sup>3</sup> : 2.50  
                              1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
                              1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 2500  
Rack travel in mm : 9.20...9.60  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
                              1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
                              1000 s: (3.00)

#### LOW IDLE

Speed rpm : 290  
Rack travel in mm : 6.90...7.10  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
                              1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
                              1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop

Speed rpm : 315  
Rack travel in mm : (13,0...14,4)  
Del.quantity cm<sup>3</sup>/ : -  
                              1000 s: (28,0...36,0)

Current A : 1,8

Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0,0...1,0)  
Current

short-duration A : 3,0

Starting test

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52,0

Remarks:

Pin projection = 16.60...16.70 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction

allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2 \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W4  
Edition : 17.02.89  
Replaces : 02.86  
Test oil : ISO-4113  
Combination no. : 0 400 076 986  
Injection pump  
Pump designation : PES6M55C32ORS157-1  
EP type number : 0 410 056 991  
Governor  
Governor design. : RSF315/2300M65  
Governor no. : 0 420 021 060

Customer-spec. information  
Customer : DB

Engine : OM603A Touring

1st version kW : 110.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Rack travel in mm : 20.00...22.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,1...8,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER

### POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

## LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring



Speed rpm : 290  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 200  
Minimum rack travel : 7.00  
Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 510...610  
Speed rpm : 1000  
Maximum rack travel : 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m : 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m : 13.20...13.40  
3rd speed rpm : 2200  
Rack travel in m : 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m : 3.90...4.10  
2nd pressure hPa : 750  
Rack travel in m : 5.80...6.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h : 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
1000 s : (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s : (3.00)  
Aneroid pressure h : 1850  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
1000 s : (47.5...51.5)

Spread cm<sup>3</sup> : 2.50  
1000 s : (3.00)

Aneroid pressure h : 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
1000 s : (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s : (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s : (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h : 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
1000 s : (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s : (3.00)

#### LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000 s : (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s : (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 315  
Rack travel in mm : (12,8...14,2)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s : (42,0...49,0)

#### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current

short-duration A : 3,0

#### Starting test

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s : 55,0

Remarks:

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^\circ$ , max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position  $46.5^\circ$ , control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop. At  $n = 290$  1/min and  $p_u = 450$  mbar control rod must move briskly to control-rod travel = 0 mm

Difference in start of delivery between max. and min. value = max.  $1^\circ$  angular displacement of cam

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$  ( $19.2 \dots 19.8^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 3,0 W3
Edition : 17.02.89
Replaces : 02.86
Test oil : ISO-4113
Combination no. : 0 400 076 987
Injection pump
Pump designation : PES6M55C320RS157
EP type number : 0 410 056 993
Governor
Governor design. : RSF315/2300M64-2
Governor no. : 0 420 021 059

Customer-spec. information
Customer : DB

Engine : OM603A

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30
: (2.15...2.35)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

C03

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del. quantity cm3/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.3...5.5

Del. quantity cm3/ : 0.5...0.6

100 s: (0.5...0.9)

Spread cm3 : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del. quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm3 : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,1...8,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER
POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring

Speed rpm : 290  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.00  
Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 510...610  
Speed rpm : 1000  
Maximum rack travel: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.10  
2nd pressure hPa : 750  
Rack travel in m: 5.80...6.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
1000 s: (47.5...51.5)

Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

1st version  
Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 315  
Rack travel in mm : (12,8...14,2)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (42,0...49,0)  
Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52,0

Remarks:

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ , control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar control rod must move briskly to control-rod travel = 0 mm

Difference in start of delivery between max. and min. value = max.  $1^\circ$  angular displacement of cam

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$  ( $19.2 \dots 19.8^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.

Testing and adjusting the control-rod-travel sensor with evaluation circuit R2.1.3

#### Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 3.230...3.310 (3.190...3.350) V must be displayed on the digital voltmeter.

#### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 2.095 \dots 2.105$  (2.098...2.102) V is indicated. Tighten fastening screws

with 1...2 Nm. Control lever to full-load stop; voltage value of 3.230...3.310 V must be attained.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W5  
Edition : 17.02.89  
Replaces : 12.09.86  
Test oil : ISO-4113

Combination no. : 0 400 076 988

Injection pump  
Pump designation : PES6M55C320RS156  
EP type number : 0 410 056 995  
Governor  
Governor design. : RSF315/2300M60-4  
Governor no. : 0 420 021 057

Customer-spec. information  
Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

#### Control lever

position degrees: 50...0

3rd rack travel in: 7,80...8,20

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 0,9...1,0

## LOW IDLE 1

### Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 290

Rack travel in mm : 5.5

Testing:

Speed rpm : 220  
Minimum rack travel: 7.00  
Speed rpm : 290  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 1.50  
Speed rpm : 620...720  
Speed rpm : 1000  
Maximum rack travel: 1.00

SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 4,20...4,40  
                  : (4,10...4,50)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 11.30...11.40  
2nd speed rpm : 1800  
Rack travel in m: 10.90...11.10  
3rd speed rpm : 2200  
Rack travel in m: 10.60...10.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 930  
Rack travel mm : 0.10...0.50

Measurement

Speed 1/min : 1000  
1st pressure hPa : 840  
Rack travel in m: 1.10...1.30  
2nd pressure hPa : 700  
Rack travel in m: 2.30...2.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1800  
Del. quantity cm<sup>3</sup>/ : 34.0...35.5  
                  1000 s: (33.0...36.5)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.00)  
Speed rpm : 2200  
Del. quantity cm<sup>3</sup>/ : 33.5...35.5  
                  1000 s: (32.5...36.5)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 55.0...0.0  
                  1000 s: (55.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version  
Speed rpm : 2500  
Rack travel in mm : 7.80...8.20  
Del. quantity cm<sup>3</sup>/ : 22.0...26.0  
                  1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.00)

LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.40...5.60  
Del. quantity cm<sup>3</sup>/ : 5.5...6.5  
                  1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
                  1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop

Speed rpm : 315  
Rack travel in mm : (12,6...14,0)  
Del. quantity cm<sup>3</sup>/ : -  
                  1000 s: (32,0...40,0)

Current A : 1,8  
Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current

short-duration A : 3,0

Starting test

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : -  
min. 1000 s: 55,0

Remarks:

Pin projection = 16.60...16.70 mm

Start-of-delivery sensor system:

adjustment and blocking with device  
KDEP 1077 = 19.3°...19.7°  
(19.2...19.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max. 1° angular

displacement of cam

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF  
-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W2  
Edition : 17.02.89  
Replaces : 02.86  
Test oil : ISO-4113  
Combination no. : 0 400 076 992  
Injection pump  
Pump designation : PES6M55C32ORS157  
EP type number : 0 410 056 993  
Governor  
Governor design. : RSF315/2300M64  
Governor no. : 0 420 021 044

Customer-spec. information  
Customer : DB

Engine : OM603A

1st version kW : 110.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Rack travel in mm : 20.00...22.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s : (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s : (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s : (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,10...8,50

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER

### POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

## LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring

Speed rpm : 290  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 200  
Minimum rack travel : 7.00  
Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 510...610  
Speed rpm : 1000  
Maximum rack travel : 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in mm : 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in mm : 13.20...13.40  
3rd speed rpm : 2200  
Rack travel in mm : 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in mm : 3.90...4.10  
2nd pressure hPa : 750  
Rack travel in mm : 5.80...6.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h : 1850  
Speed rpm : 1600  
Del. quantity cm<sup>3</sup>/ : 50.0...51.5  
1000 s : (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s : (3.00)  
Aneroid pressure h : 1850  
Speed rpm : 2200  
Del. quantity cm<sup>3</sup>/ : 48.5...50.5  
1000 s : (47.5...51.5)

Spread cm<sup>3</sup> : 2.50  
1000 s : (3.00)  
Aneroid pressure h : 1050  
Speed rpm : 1000  
Del. quantity cm<sup>3</sup>/ : 33.0...34.0  
1000 s : (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s : (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s : (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

1st version  
Aneroid pressure h : 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del. quantity cm<sup>3</sup>/ : 29.0...33.0  
1000 s : (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s : (3.00)

#### LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Del. quantity cm<sup>3</sup>/ : 5.5...6.5  
1000 s : (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s : (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 315  
Rack travel in mm : (12,8...14,2)  
Del. quantity cm<sup>3</sup>/ : -  
1000 s : (42,0...49,0)  
Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : -  
min. 1000 s : 52,0

Remarks:

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^\circ$ , max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position  $46.5^\circ$ , control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop. At  $n = 290$  1/min and  $p_u = 450$  mbar control rod must move briskly to control-rod travel = 0 mm

Difference in start of delivery between max. and min. value = max.  $1^\circ$  angular displacement of cam

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$  ( $19.2 \dots 19.8^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.

Testing and adjusting the control-rod-travel sensor with evaluation circuit

#### R2.1.3

#### Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 3.230...3.310 (3.190...3.350) V must be displayed on the digital voltmeter.

#### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 2.095 \dots 2.105$  (2.098...2.102) V is indicated. Tighten fastening screws

with 1...2 Nm. Control lever to full-load stop; voltage value of 3.230...3.310 V must be attained.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W  
Edition : 06.04.88  
Replaces : 09.03.87  
Test oil : ISO-4113

Combination no. : 0 400 076 994

Injection pump  
Pump designation : PES6M55C320RS156  
EP type number : 0 410 056 995  
Governor  
Governor design. : RSF315/23GOM59-3  
Governor no. : 0 420 021 040

Customer-spec. information  
Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever  
position degrees: 50...0

3rd rack travel in: 7,80...8,20

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 10000

Rack travel in mm : ,9...1,0

## LOW IDLE 1

Control lever  
position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 290

Rack travel in mm : 5.5

#### Testing:

Speed rpm : 220  
Minimum rack travel : 7.00  
Speed rpm : 290  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 1.50  
Speed rpm : 620...720  
Speed rpm : 1000  
Maximum rack travel : 1.00

#### SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 4,20...4,40  
                      : (4,10...4,50)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in mm : 11.30...11.40  
2nd speed rpm : 1800  
Rack travel in mm : 10.90...11.10  
3rd speed rpm : 2200  
Rack travel in mm : 10.60...10.80

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 1800  
Del. quantity cm<sup>3</sup>/ : 34.0...35.5  
                  1000 s : (33.0...36.5)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s : (3.00)  
Speed rpm : 2200  
Del. quantity cm<sup>3</sup>/ : 33.5...35.5  
                  1000 s : (32.5...36.5)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s : (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 55.0...0.0  
                  1000 s : (55.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

##### 1st version

Speed rpm : 2500  
Rack travel in mm : 7.80...8.20  
Del. quantity cm<sup>3</sup>/ : 22.0...26.0  
                  1000 s : (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s : (3.00)

#### LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.40...5.60  
Del. quantity cm<sup>3</sup>/ : 5.5...6.5  
                  1000 s : (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
                  1000 s : (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 315  
Rack travel in mm : (12,6...14,0)  
Del. quantity cm<sup>3</sup>/ : -  
                  1000 s : 32,0...40,0)  
Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : -  
min. 1000 s : 55,0

Remarks:

:  
Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 19.3°...19.7°  
(19.2...19.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 290 1/min and pu = 450 mbar  
control rod must move briskly to  
control-rod travel = 0 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 1 g 40  
Edition : 24.02.89  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 400 463 158

Injection pump  
Pump designation : PES3A80D410/3RS1324  
EP type number : 0 410 483 017  
Governor  
Governor design. : RSV325...1150A8C705-  
1L  
Governor no. : 0 420 232 521

Customer-spec. information  
Customer : KHD

Engine : F3L912

1st version kW : 37.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
: (1.85...2.05)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 2

Phasing : 0-120-240  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

---

Rack travel in mm : 10.50...10.60

---

Del. quantity cm<sup>3</sup>/ : 5.4...5.5  
100 s: (5.2...5.6)

---

Spread cm<sup>3</sup> : 0.2  
100 s: (0.4)

---

2nd speed rpm : 325.0  
Rack travel in mm : 8.3...8.5  
Del. quantity cm<sup>3</sup>/ : 1.2...1.8  
100 s: (1.0...1.9)

Spread cm<sup>3</sup> : 0.2  
100 s: (0.3)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : 5.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1150  
Del. quantity : 54.0...55.0  
1000 : (52.5...56.5)

Spread cm<sup>3</sup> : 2.50  
1000 : (4.00)

## RATED SPEED

1st version  
Control Lever  
position degrees: 54...62

Testing:  
1st rack travel in: 9.50  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1225...1255  
3rd rack travel in: 4.00

Speed rpm : 1240...1270  
4th rack travel in: 1420  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 6.00...6.20  
Rack travel in mm : 2.00  
Speed rpm : 410...470

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 500  
Rack travel in m: 11.30...11.40  
3rd speed rpm : 950  
Rack travel in m: 10.80...11.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 51.5...53.5  
1000 s: (49.5...55.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 9.50  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

Remarks:

: FENDT

#### APPLICATION

Tractor (tractor engines)

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : KHD 1 g 41  
 Edition : 24.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 463 159  
 Injection pump  
 Pump designation : PES3A80D410/3RS1324  
 EP type number : 0 410 483 017  
 Governor  
 Governor design. : RSV325...1095A8C657-  
 5L  
 Governor no. : 0 420 232 523  
 Customer-spec. information  
 Customer : KHD  
 Engine : F3L913 \*  
 1st version kW : 33.0  
 Rated speed : 2190

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 1.90...2.00  
 : (1.85...2.05)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 2

Phasing : 0-120-240  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 800  
 Rack travel in mm : 10.70...10.80  
 Del.quantity cm3/ : 5.0...5.1  
 100 s: (4.9...5.3)  
 Spread cm3 : 0.2  
 100 s: (0.3)  
 2nd speed rpm : 325.0  
 Rack travel in mm : 8.3...8.5  
 Del.quantity cm3/ : 1.2...1.8  
 100 s: (1.0...1.9)  
 Spread cm3 : 0.2  
 100 s: (0.3)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 5.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 800  
 Del.quantity : 50.5...51.5  
 1000 : (49.0...53.0)  
 Spread cm3 : 2.50  
 1000 : (3.50)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 51...59

Testing:  
 1st rack travel in: 8.70  
 Speed rpm : 1145...1155  
 2nd rack travel in: 4.00



Speed rpm : 1175...1205  
3rd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

Remarks:

: FENDT

#### LOW IDLE 1

Control lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 410...470

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1095  
Rack travel in m: 9.70...9.80  
2nd speed rpm : 500  
Rack travel in m: 10.70...10.80  
3rd speed rpm : 1015  
Rack travel in m: 10.20...10.40

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 1095  
Del. quantity cm<sup>3</sup>/ : 48.0...52.0  
1000 s: (46.0...54.0)  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 33.0...34.0  
1000 s: (31.0...36.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (-)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.70  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : KHD 1 g 42  
 Edition : 03.03.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 464 135  
 Injection pump  
 Pump designation : PES4A80D410/3RS1300  
 EP type number : 0 410 484 015  
 Governor  
 Governor design. : RSV325...1150A8C657-  
 4L  
 Governor no. : 0 420 232 522

Customer-spec. information  
 Customer : KHD

Engine : F4L912

1st version kW : 51.0  
 Rated speed : 2300

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
 : (1.85...2.05)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1150  
 Rack travel in mm : 10.50...10.60  
 Del.quantity cm<sup>3</sup>/ : 5.9...6.0  
 100 s: (5.8...6.2)  
 Spread cm<sup>3</sup> : 0.2  
 100 s: (0.4)

2nd speed rpm : 325.0  
 Rack travel in mm : 7.5...7.7  
 Del.quantity cm<sup>3</sup>/ : 0.9...1.5  
 100 s: (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.2  
 100 s: (0.3)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 5.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1150  
 Del.quantity : 59.5...60.5  
 1000 : (58.0...62.0)  
 Spread cm<sup>3</sup> : 2.50  
 1000 : (4.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 54...62

Testing:  
 1st rack travel in: 9.50  
 Speed rpm : 1190...1200  
 2nd rack travel in: 4.00  
 Speed rpm : 1220...1250  
 3rd rack travel in: 4.00

Speed rpm : 1250...1280  
4th rack travel in: 1420  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 20...28  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 7.1

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 325  
Rack travel in mm : 7.50...7.70  
Rack travel in mm : 2.00  
Speed rpm : 455...515

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 500  
Rack travel in m: 10.80...10.90  
3rd speed rpm : 880  
Rack travel in m: 10.60...10.70

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 54.0...56.0  
1000 s: (52.0...58.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

Remarks:

: FENDT

#### APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

Note remarks

Test sheet : KHD 19,0 q  
 Edition : 12.09.86  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 640 113  
 Injection pump  
 Pump designation : PE12A95D610LS2453  
 EP type number : 0 410 690 998  
 Governor  
 Governor design. : RQV300...1250AB1223L  
 Governor no. : 0 420 212 092

Customer-spec. information  
 Customer : KHD

Engine : F12L413F

1st version kW : 282.0  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.00  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250  
 Rack travel in mm : 10.40...10.50  
 Del.quantity cm<sup>3</sup>/ : 9.4...9.6  
 100 s: (9.2...9.8)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.4...6.6  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.6  
 100 s: (0.7...1.8)  
 Spread cm<sup>3</sup> : 0.7  
 100 s: (0.9)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 200  
 travel mm : 0.70...0.80  
 2nd speed rpm : 500  
 travel mm : 2.60...2.80  
 3rd speed rpm : 900  
 travel mm : 5.60...5.80  
 4th speed rpm : 1300  
 travel mm : 8.60...8.70

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1275  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Del.quantity : 94.0...96.0  
 1000 : (92.0...98.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 50...58

Testing:  
1st rack travel in: 9.40  
Speed rpm : 1290...1300  
2nd rack travel in: 4.50  
Speed rpm : 1360...1390  
3rd rack travel in: 0.00...1.00  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 14...22

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 375...485

TORQUE CONTROL  
Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 500  
Rack travel in m: 10.90...11.00  
3rd speed rpm : 790  
Rack travel in m: 10.70...10.90  
4th speed rpm : 885  
Rack travel in m: 10.40...10.60

## START CUT-OUT

Speed 1/min : 220 (240)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 93.5...96.5  
1000 s: (91.0...99.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.40  
Speed rpm : 1290...1300

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 13.50...14.20

Remarks: :

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 12,7 p5  
Edition : 07.02.89  
Replaces : 5.8.88  
Test oil : ISO-4113

Combination no. : 0 400 648 111

Injection pump  
Pump designation : PE8A95D410LS2608  
EP type number : 0 410 698 988  
Governor  
Governor design. : RQ300/1250AB987DL  
Governor no. : 0 420 202 277

Customer-spec. information  
Customer : KHD

Engine : F8L413F

1st version kW : 188.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-  
4- 3

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.40...10.50

Del. quantity cm<sup>3</sup>/ : 9.6...9.8

100 s : (9.4...10.0)

Spread cm<sup>3</sup> : 0.3

100 s : (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.5...6.7

Del. quantity cm<sup>3</sup>/ : 0.9...1.5

100 s : (0.6...1.7)

Spread cm<sup>3</sup> : 0.5

100 s : (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.60...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del. quantity : 96.5...98.5

1000 : (94.5...100.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 16.0

Testing:

1st rack travel in: 9.40

Speed rpm : 1295...1310

2nd rack travel in: 4.00

Speed rpm : 1335...1365

4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0

Testing:

Speed rpm : 100  
Minimum rack trave: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 345...385  
Speed rpm : 550  
Maximum rack trave: 1.00

TORQUE CONTROL

Dimension a mm : 0.25  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 550  
Rack travel in m: 10.90...11.00  
3rd speed rpm : 850  
Rack travel in m: 10.60...10.80  
4th speed rpm : 970  
Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650  
Del.quantity cm3/ : 95.0...98.0  
1000 s: (92.5...95.5)

RACK STOP ADJUSTMENT

Speed rpm : 600

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 1295...1310

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.50...6.70  
Del.quantity cm3/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm3 : 5.50  
1000 s: (7.50)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : KHD 12,7 p2  
 Edition : 07.02.89  
 Replaces : 18.9.87  
 Test oil : ISO-4113  
 Combination no. : 0 400 648 141  
 Injection pump  
 Pump designation : PE8A95D410LS2608  
 EP type number : 0 410 698 988  
 Governor  
 Governor design. : RQV300...1250AB1195L  
 Governor no. : 0 420 212 172

Customer-spec. information  
 Customer : KHD

Engine : F8L413F

1st version kW : 188.0  
 Rated speed : 2500

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-  
 4- 3

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1250

Rack travel in mm : 10.40...10.50

Del.quantity cm<sup>3</sup>/ : 9.6...9.8

100 s : (9.4...10.0)

Spread cm<sup>3</sup> : 0.3

100 s : (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.5...6.7

Del.quantity cm<sup>3</sup>/ : 0.9...1.5

100 s : (0.6...1.7)

Spread cm<sup>3</sup> : 0.5

100 s : (0.7)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300  
 travel mm : 1.20...1.30

2nd speed rpm : 500  
 travel mm : 2.80...3.00

3rd speed rpm : 1000  
 travel mm : 6.50...6.70

4th speed rpm : 1290  
 travel mm : 8.60...8.80

5th speed rpm : 1375  
 travel mm : 9.40...9.60

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1275

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1250

Del.quantity : 96.5...98.5

1000 : (94.5...100.5)



Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 47...55

Testing:  
1st rack travel in: 9.40  
Speed rpm : 1290...1300  
2nd rack travel in: 4.50  
Speed rpm : 1360...1390  
4th rack travel in: 1500  
Speed rpm : 0.30...1.00

LOW IDLE 1  
Control lever  
position degrees: 14...22  
Rack travel in mm : 6.6

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.50...6.70

CONSTANT REGULATION  
Speed rpm : 375...485

TORQUE CONTROL  
Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 500  
Rack travel in m: 10.90...11.00  
3rd speed rpm : 850  
Rack travel in m: 10.60...10.80  
4th speed rpm : 950  
Rack travel in m: 10.40...10.60

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 95.0...98.0  
1000 s: (92.5...100.5)

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)

Remarks:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : KHD 12,7 p6  
 Edition : 07.02.89  
 Replaces : 30.9.88  
 Test oil : ISO-4113

Combination no. : 0 400 648 142

Injection pump  
 Pump designation : PE8A95D410LS2608  
 EP type number : 0 410 698 988  
 Governor  
 Governor design. : RQV350...1250AB990-1  
 L  
 Governor no. : 0 420 212 182

Customer-spec. information  
 Customer : KHD

Engine : F8L413F

1st version kW : 174.0  
 Rated speed : 2500

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 8- 7- 2- 6- 5-  
 4- 3

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1225

---

Rack travel in mm : 10.00...10.10

---

Del.quantity cm<sup>3</sup>/ : 8.9...9.1  
 100 s: (8.7...9.3)

---

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 6.4...6.6  
 Del.quantity cm<sup>3</sup>/ : 0.9...1.5  
 100 s: (0.6...1.7)

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.7)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 1.20...1.30

2nd speed rpm : 600  
 travel mm : 3.80...4.00

3rd speed rpm : 900  
 travel mm : 5.20...5.50

4th speed rpm : 1315  
 travel mm : 9.30...9.70

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1225  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1225  
 Del.quantity : 89.0...91.0  
 1000 : (87.0...93.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control Lever  
position degrees: 61...69

Testing:  
1st rack travel in: 9.00  
Speed rpm : 1265...1275  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 9...17

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.00  
Speed rpm : 350  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 370...480

TORQUE CONTROL  
Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 1225  
Rack travel in m: 10.00...10.10  
2nd speed rpm : 500  
Rack travel in m: 10.40...10.50  
3rd speed rpm : 970  
Rack travel in m: 10.20...10.40  
4th speed rpm : 1080  
Rack travel in m: 9.80...10.00

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 700  
Del.quantity cm3/ : 90.5...93.5  
1000 s: (88.0...96.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.00  
Speed rpm : 1265...1275

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.70...15.30

Remarks: :

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : KHD 15,8 L  
 Edition : 07.02.89  
 Replaces : 5.84  
 Test oil : ISO-4113  
 Combination no. : 0 400 649 196  
 Injection pump  
 Pump designation : PE10A95D610/4LS2452  
 EP type number : 0 410 699 998  
 Governor  
 Governor design. : RQV750AB996L  
 Governor no. : 0 420 212 091

Customer-spec. information  
 Customer : KHD

Engine : F10L413F

1st version kW : 162.0  
 Rated speed : 1500

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 9.00...12.00

D01

Firing order : 1-10- 9- 4- 3- 6-  
 5- 8- 7- 2

Phasing : 0-27-72-99-144-171-  
 216-243-288-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 710  
 Rack travel in mm : 10.00...10.10  
 Del.quantity cm<sup>3</sup>/ : 9.6...9.8  
 100 s : (9.4...10.0)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.6...5.8  
 Del.quantity cm<sup>3</sup>/ : 0.4...0.9  
 100 s : (0.1...1.1)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 760  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 710  
 Del.quantity : 96.0...98.0  
 1000 : (94.0...100.0)  
 Spread cm<sup>3</sup> : 3.00  
 1000 : (6.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 760  
 Rack travel in mm : 16.5

Testing:  
 1st rack travel in: 9.70  
 Speed rpm : 750...755  
 2nd rack travel in: 4.00  
 Speed rpm : 773...788

START CUT-OUT

Speed 1/min : 660 (680)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 116.5  
1000 s: ( 113.5)  
Rack travel in mm : 13.90...14.30

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

APPLICATION

Compressor

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 15,0 d1
Edition : 10.02.89
Replaces : 4.86
Test oil : ISO-4113
Combination no. : 0 400 649 240
Injection pump
Pump designation : PE10A95D520/5LS2604
EP type number : 0 410 699 993
Governor
Governor design. : RQV250...1150AB1189R
Governor no. : 0 420 213 102

Customer-spec. information
Customer : MAN

Engine : D2840 ME
1st version kW : 270.0
Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42
Overflow valve : 1 417 413 000
Inlet press., bar : 1.50
Test nozzle holder
assembly : 0 681 343 009
Opening
pressure, bar : 172...175
Test Lines : 1 680 750 003
Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
Prestroke mm : 1.70...1.80
: (1.65...1.85)
Rack travel in mm : 9.00...12.00

D03

Firing order : 10- 9- 4- 1- 8- 7-
6- 3- 5- 2

Phasing : 0-45-72-117-144-189-
216-261-288-333
Tolerance + - ° : 0.50 (0.75)
Time to cyl. no. : 10

BASIC SETTING

1st speed rpm : 1150
Rack travel in mm : 13.00...13.10
Del.quantity cm3/ : 12.8...13.0
100 s: (12.2...12.8)
Spread cm3 : 0.3
100 s: (0.6)
2nd speed rpm : 250.0
Rack travel in mm : 6.9...7.1
Del.quantity cm3/ : 1.0...1.6
100 s: (0.7...1.8)
Spread cm3 : 0.3
100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350
travel mm : 2.00...2.50
2nd speed rpm : 850
travel mm : 5.75...6.00
3rd speed rpm : 1150
travel mm : 7.50...7.90
4th speed rpm : 1300
travel mm : 9.25...9.75

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1230
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1150
Del.quantity : 128.0...130.0
1000 : (122.5...128.5)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 58...66

Testing:  
1st rack travel in: 12.00  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1280...1310  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16

Testing:  
Speed rpm : 100  
Speed rpm : 250  
Rack travel in mm : 6.90...7.10  
Rack travel in mm : 2.00  
Speed rpm : 400...460

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 500  
Rack travel in m: 13.00...13.20

START CUT-OUT  
Speed 1/min : 170 (190)

BREAKAWAY  
1st version  
1mm rack travel less than  
full load rack tr: 12.00  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY  
Speed rpm : 100  
Rack travel in mm : 15.90...16.50

Remarks:  
:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : KHD 12,7 r1  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 400 678 040

Injection pump  
 Pump designation : PE8A95D410LS2451  
 EP type number : 0 410 698 992  
 Governor  
 Governor design. : RSV300...1325A8C1002  
 L  
 Governor no. : 0 420 232 310

Customer-spec. information  
 Customer : KHD

Engine : F8L413F

1st version kW : 188.0  
 Rated speed : 2650  
 2nd version kW : 157.0  
 Rated speed : 2300

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 8- 7- 2- 6- 5-  
 4- 3

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1325

---

Rack travel in mm : 9.70...9.80

---

Del.quantity cm3/ : 9.1...9.3

---

100 s: (8.9...9.5)

---

Spread cm3 : 0.3

---

100 s: (0.6)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 5.9...6.1  
 Del.quantity cm3/ : 0.9...1.5  
 100 s: (0.6...1.7)  
 Spread cm3 : 0.5  
 100 s: (0.9)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1325  
 Del.quantity : 91.5...93.5  
 1000 : (89.5...95.5)  
 Spread cm3 : 3.00  
 1000 : (6.00)

2nd version  
 Speed rpm : 1150  
 Del.quantity cm3/ : 83.0...85.0  
 1000 s: (81.0...87.0)  
 Spread cm3 : 3.00  
 1000 s: (3.00)

**RATED SPEED**

1st version



Control Lever  
position degrees: 59...67

Remarks:

Testing:  
1st rack travel in: 8.70  
Speed rpm : 1365...1375  
2nd rack travel in: 4.00  
Speed rpm : 1390...1420  
4th rack travel in: 1575  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control Lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 310...370  
Speed rpm : 700  
Maximum rack trave: 1.00

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1325  
Rack travel in m: 9.70...9.80  
2nd speed rpm : 500  
Rack travel in m: 10.00...10.10

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8.70  
Speed rpm : 1365...1375

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 116.5...127.5  
1000 s: (113.5...130.5)  
Rack travel in mm : 14.00...14.40

#### HIGH IDLE

1st version  
Rack travel in mm : 3.90...4.10  
Spread cm3 : 10.00

DD6

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 3,8 g  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 844 048  
 Injection pump  
 Pump designation : PES4A90D410RS2294  
 EP type number : 0 410 894 011  
 Governor  
 Governor design. : RQV300...1425AB780L  
 Governor no. : 0 420 212 045

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM 314

1st version kW : 64.0  
 Rated speed : 2850

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25  
 : (2.10...2.30)

Rack travel in mm : 9.00...12.00

D07

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1400

Rack travel in mm : 9.70...9.80

Del.quantity cm<sup>3</sup>/ : 6.3...6.4

100 s: (6.1...6.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.4)

2nd speed rpm : 300.0

Rack travel in mm : 7.5...7.7

Del.quantity cm<sup>3</sup>/ : 0.9...1.5

100 s: (0.7...1.7)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1460

travel mm : 8.40...8.60

2nd speed rpm : 950

travel mm : 5.20...5.50

3rd speed rpm : 775

travel mm : 4.10...4.60

4th speed rpm : 550

travel mm : 2.70...3.00

5th speed rpm : 300

travel mm : 0.70...1.20

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1420

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1400

Del.quantity : 63.5...64.5

1000 : (61.5...66.5)

Spread cm<sup>3</sup> : 3.00

1000 : (4.50)

**RATED SPEED**

1st version  
Control lever  
position degrees: 61...69

Testing:  
1st rack travel in: 8.70  
Speed rpm : 1460...1470  
2nd rack travel in: 4.00  
Speed rpm : 1540...1570

LOW IDLE 1  
Control Lever  
position degrees: 11...19

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 7.50...7.70

CONSTANT REGULATION  
Speed rpm : 350...500

START CUT-OUT

Speed 1/min : 250 (240)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8.70  
Speed rpm : 1460...1470

INTERMEDIATE RATED SPEED

Control Lever  
position degrees: 42...50  
Rack travel in mm : 8.70  
Speed rpm : 695...705  
Rack travel in mm : 4.00  
Speed rpm : 830...860

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 71.0...81.0  
1000 s: (68.0...84.0)  
Rack travel in mm : 13.70...14.30

Remarks:  
:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,8 g 5  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 844 055  
 Injection pump  
 Pump designation : PES4A90D410RS2294  
 EP type number : 0 410 894 011  
 Governor  
 Governor design. : RQV300...1400AB836DL  
 Governor no. : 0 420 212 050

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM314

1st version kW : 62.0  
 Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25  
 : (2.10...2.30)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 9.70...9.80

Del.quantity cm<sup>3</sup>/ : 6.3...6.4

100 s: (6.1...6.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.4)

2nd speed rpm : 300.0

Rack travel in mm : 7.5...7.7

Del.quantity cm<sup>3</sup>/ : 0.9...1.5

100 s: (0.7...1.7)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1460

travel mm : 8.40...8.60

2nd speed rpm : 950

travel mm : 5.20...5.50

3rd speed rpm : 775

travel mm : 4.10...4.60

4th speed rpm : 550

travel mm : 2.70...3.00

5th speed rpm : 300

travel mm : 0.70...1.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1420

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Del.quantity : 63.5...64.5

1000 : (61.5...66.5)

Spread cm<sup>3</sup> : 3.00

1000 : (4.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 61...69

Testing:  
1st rack travel in: 8.70  
Speed rpm : 1460...1470  
2nd rack travel in: 4.00  
Speed rpm : 1540...1570

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 7.50...7.70

CONSTANT REGULATION  
Speed rpm : 350...500

#### START CUT-OUT

Speed 1/min : 220 (240)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8.70  
Speed rpm : 1460...1470

#### INTERMEDIATE RATED SPEED

Control lever  
position degrees: 113...121  
Rack travel in mm : 8.70  
Speed rpm : 1295...1305  
Rack travel in mm : 4.00  
Speed rpm : 1395...1425

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 71.0...81.0  
1000 s: (68.0...84.0)  
Rack travel in mm : 13.70...14.30

Remarks:  
:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4,0 a 12  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 844 094  
  
Injection pump  
Pump designation : PES4A90D410RS2666-2  
EP type number : 0 410 894 033  
Governor  
Governor design. : RQV300...1400AB1065-12L  
Governor no. : 0 420 212 207  
  
Customer-spec. information  
Customer : DAIMLER-BENZ  
  
Engine : OM364  
  
1st version kW : 61.0  
Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 000  
  
Inlet press., bar : 1.50  
  
Test nozzle holder  
assembly : 0 681 343 009  
  
Opening  
pressure, bar : 172...175  
  
Test lines : 1 680 750 015  
  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
  
Prestroke mm : 2.25...2.35  
: (2.20...2.40)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1400  

---

Rack travel in mm : 10.50...10.60

Del. quantity cm<sup>3</sup>/ : 5.9...6.0  

---

100 s: (5.7...6.2)

Spread cm<sup>3</sup> : 0.3  

---

100 s: (0.5)

2nd speed rpm : 300.0  
Rack travel in mm : 8.6...8.8  
Del. quantity cm<sup>3</sup>/ : 0.8...1.2  
100 s: (0.6...1.4)  
Spread cm<sup>3</sup> : 0.2  
100 s: (0.4)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 0.80...1.30  
2nd speed rpm : 500  
travel mm : 2.30...2.80  
3rd speed rpm : 750  
travel mm : 4.10...4.30  
4th speed rpm : 1500  
travel mm : 8.50...8.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1400  
Del. quantity : 59.0...60.0  
1000 : (57.0...62.0)  
Spread cm<sup>3</sup> : 3.00  
1000 : (5.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 58...66

Testing:  
1st rack travel in: 9.50

Speed rpm : 1440...1450  
2nd rack travel in: 4.00  
Speed rpm : 1535...1565  
4th rack travel in: 1700  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 20...28

Testing:  
Speed rpm : 100  
Minimum rack travel: 10.20  
Speed rpm : 300  
Rack travel in mm : 8.60...8.80

CONSTANT REGULATION  
Speed rpm : 540...680

TORQUE CONTROL  
Dimension a mm : 1.00  
Torque control curve - 1st version  
1st speed rpm : 1400  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 450  
Rack travel in m: 11.50...11.60  
3rd speed rpm : 850  
Rack travel in m: 10.90...11.10

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 450  
Del.quantity cm<sup>3</sup>/ : 45.0...47.0  
1000 s: (42.5...49.5)  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 47.5...50.5  
1000 s: (45.0...53.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1440...1450

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)  
Rack travel in mm : 17.00...17.40

Remarks:

Set shutoff stop to contact at  
3.0...3.5 mm control-rod travel.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 9,2 f 1
Edition : 10.02.89
Replaces : 28.8.87
Test oil : ISO-4113
Combination no. : 0 400 845 079
Injection pump
Pump designation : PES5A95D32OLS2504
EP type number : 0 410 895 984
Governor
Governor design. : RQ250/1100AB1197R
Governor no. : 0 420 201 639

Customer-spec. information
Customer : MAN

Engine : D2565 MUL
1st version kW : 141.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42
Overflow valve : 1 417 413 000
Inlet press., bar : 1.00
Test nozzle holder assembly : 0 681 343 009
Opening pressure, bar : 172...175
Test Lines : 1 680 750 014
Outside diameter x wall thickness x Length mm : 6.00X2.00X600
(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
Prestroke mm : 1.50...1.60
: (1.45...1.65)
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1100
Rack travel in mm : 11.30...11.40
Del.quantity cm3/ : 11.4...11.6
100 s: (11.2...11.8)
Spread cm3 : 0.3
100 s: (0.6)

2nd speed rpm : 250.0
Rack travel in mm : 6.4...6.6
Del.quantity cm3/ : 1.5...2.1
100 s: (1.2...2.3)
Spread cm3 : 0.3
100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 600
Rack travel in mm : 15.60...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1100
Del.quantity : 114.0...116.0
1000 : (112.0...118.0)
Spread cm3 : 3.00
1000 : (6.00)

RATED SPEED

1st version
Setting point:
Speed rpm : 600
Rack travel in mm : 16.0

Testing:
1st rack travel in: 10.30
Speed rpm : 1145...1160
2nd rack travel in: 4.00
Speed rpm : 1195...1225
4th rack travel in: 1300
Speed rpm : 0.00...1.00



LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.5

Testing:

Speed rpm : 100  
Minimum rack trave: 8.00  
Speed rpm : 250  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 370...410

TORQUE CONTROL

Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.30...11.40  
2nd speed rpm : 600  
Rack travel in m: 11.70...11.80  
3rd speed rpm : 940  
Rack travel in m: 11.50...11.70  
4th speed rpm : 1015  
Rack travel in m: 11.40...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500  
Del.quantity cm3/ : 113.0...116.0  
1000 s: (110.5...118.5)  
Speed rpm : 800  
Del.quantity cm3/ : 115.5...118.5  
1000 s: (113.0...121.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 10.30  
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 147.0...157.0  
1000 s: (144.0...160.0)  
Rack travel in mm : 15.70...16.30

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.40...6.60  
Del.quantity cm3/ : 15.0...21.0  
1000 s: (12.5...23.5)

Spread cm3 : 3.00  
1000 s: (5.00)

Remarks:

: MAN-NR. 2-7500  
Set idle stop at 250 min<sup>-1</sup> to a  
control-rod travel of 6.5 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 7,0 c 1  
 Edition : 03.03.89  
 Replaces : 5.9.88  
 Test oil : ISO-4113

Combination no. : 0 400 846 264

Injection pump  
 Pump designation : PES6A85D320RS2337  
 EP type number : 0 410 886 921  
 Governor  
 Governor design. : RQ200/1250AB801DR  
 Governor no. : 0 420 203 089

Customer-spec. information  
 Customer : MAN

Engine : D0846HM42U

1st version kW : 118.0  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60  
 : (1.45...1.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.70...10.80

Del.quantity cm<sup>3</sup>/ : 7.0...7.1

100 s: (6.8...7.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.4)

2nd speed rpm : 200.0

Rack travel in mm : 8.4...8.6

Del.quantity cm<sup>3</sup>/ : 1.8...2.4

100 s: (1.6...2.6)

Spread cm<sup>3</sup> : -

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 550

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 70.0...71.0

1000 : (68.0...73.0)

Spread cm<sup>3</sup> : 3.00

1000 : (4.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.75

Speed rpm : 1295...1310

2nd rack travel in: 4.00

Speed rpm : 1325...1355

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 200  
Rack travel in mm : 8.5

Testing:

Speed rpm : 100  
Minimum rack trave: 9.90  
Speed rpm : 200  
Rack travel in mm : 8.40...8.60  
Rack travel in mm : 2.00  
Speed rpm : 340...380

TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 10.70...10.80  
2nd speed rpm : 500  
Rack travel in m: 11.40...11.50  
4th speed rpm : 1000  
Rack travel in m: 11.20...11.40  
5th speed rpm : 1125  
Rack travel in m: 10.90...11.10

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500  
Del.quantity cm3/ : 0.0...69.5  
1000 s: (0.0...72.0)  
Speed rpm : 800  
Del.quantity cm3/ : 69.0...72.0  
1000 s: (66.5...74.5)

RACK STOP ADJUSTMENT

Speed rpm : 200

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.75  
Speed rpm : 1295...1310

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 123.0...133.0  
1000 s: (120.0...136.0)  
Rack travel in mm : 18.10...18.50

Remarks:

: MAN-NR.1-7504

APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 9,6 k 6  
Edition : 11.11.88  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 846 432  
Injection pump  
Pump designation : PES6A95D41ORS2416  
EP type number : 0 410 896 961  
Governor  
Governor design. : RQ750AB1240L  
Governor no. : 0 420 200 110

Customer-spec. information  
Customer : KHD

Engine : F6L413FR

1st version kW : 122.0  
Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X-600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
                  : (1.85...2.05)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 10.40...10.50

Del.quantity cm<sup>3</sup>/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 101.0...103.0

1000 : (99.0...105.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Testing:

1st rack travel in: 9.40

Speed rpm : 750...755

2nd rack travel in: 3.70

Speed rpm : 780...785

## TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 700

Rack travel in m: 10.40...10.50

2nd speed rpm : 500

Rack travel in m: 10.40...10.60

## START CUT-OUT

Speed 1/min : 640 (660)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 12.90...13.20

Remarks:

:

APPLICATION

Generator set

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 9,6 p 1  
Edition : 09.03.87  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 846 433  
Injection pump  
Pump designation : PES6A95D410RS2416  
EP type number : 0 410 896 961  
Governor  
Governor design. : RQ900AB1054L  
Governor no. : 0 420 200 064

Customer-spec. information  
Customer : KHD

Engine : F6L413FR

1st version kW : 106.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
                  : (1.85...2.05)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 9.00...9.10

Del.quantity cm<sup>3</sup>/ : 8.5...8.7

100 s : (8.3...8.9)

Spread cm<sup>3</sup> : 0.3

100 s : (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.6...5.8

Del.quantity cm<sup>3</sup>/ : 0.9...1.5

100 s : (0.6...1.7)

Spread cm<sup>3</sup> : 0.3

100 s : (0.5)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Del.quantity : 85.5...87.5

1000 : (83.5...89.5)

Spread cm<sup>3</sup> : 3.00

1000 : (6.00)

## RATED SPEED

1st version

Testing:

1st rack travel in: 8.60

Speed rpm : 900...905

2nd rack travel in: 3.50

Speed rpm : 930...940

## START CUT-OUT

Speed 1/min : 810 (830)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.60

Speed rpm : 900...905

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 13.20...13.80

Remarks:

:

APPLICATION

Generator set



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 6,2 p 2
Edition : 07.02.89
Replaces : 30.5.88
Test oil : ISO-4113
Combination no. : 0 400 846 538
Injection pump
Pump designation : PES6A95D32ORS2693
EP type number : 0 410 896 914
Governor
Governor design. : RQ300/1300AB1204R
Governor no. : 0 420 201 640

Customer-spec. information
Customer : DAF

Engine : DNT 620

1st version kW : 130.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Rack travel in mm : 7.50...10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
& maximum rack tra: 21.00
Difference ° CS : 2.50...3.50

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 0.90...1.00

Del.quantity cm3/ : 7.7...7.8

100 s: (7.5...8.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.5...6.7

Del.quantity cm3/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 850

Rack travel in mm : 16.80...18.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 700

Del.quantity : 77.5...78.5

1000 : (75.5...80.5)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 850

Rack travel in mm : 17.6



Testing:  
1st rack travel in: 9.70  
Speed rpm : 1350...1365  
2nd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.60  
Speed rpm : 300  
Rack travel in mm : 6.50...6.70  
Rack travel in mm : 2.00  
Speed rpm : 545...585

#### TORQUE CONTROL

Dimension a mm : 0.55  
Torque control curve - 1st version  
1st speed rpm : 1290  
Rack travel in m: 9.60...9.70  
2nd speed rpm : 850  
Rack travel in m: 11.20...11.40  
3rd speed rpm : 935  
Rack travel in m: 10.80...11.10  
4th speed rpm : 1080  
Rack travel in m: 10.60...11.00

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 11.50...11.60

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.20...11.40  
2nd pressure hPa : 250  
Rack travel in m: 11.40...11.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 1290  
Del.quantity cm<sup>3</sup>/ : 73.0...75.0  
1000 s: (70.5...77.5)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 65.0...67.0  
1000 s: (63.0...69.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 1350...1365

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...145.0  
1000 s: (127.0...148.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.50...6.70  
Del.quantity cm<sup>3</sup>/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:

When adjusting the governor, observe  
service information on microcard  
W-400/008.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 3,1 b 2  
 Edition : 10.02.89  
 Replaces : 12.1.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 863 008  
 Injection pump  
 Pump designation : PES3A90D320/3RS2658  
 EP type number : 0 410 893 004  
 Governor  
 Governor design. : RSV325...1500A2C505-3R  
 Governor no. : 0 420 233 229

Customer-spec. information  
 Customer : MWM

Engine : D226B-3

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05  
 : (2.90...3.10)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 2- 3

Phasing : 0-120-240

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1100  
 Rack travel in mm : 11.20...11.30  
 Del. quantity cm<sup>3</sup>/ : 8.9...9.0  
 100 s: (8.7...9.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

2nd speed rpm : 325.0  
 Rack travel in mm : 9.7...9.9  
 Del. quantity cm<sup>3</sup>/ : 4.6...5.2  
 100 s: (4.4...5.4)  
 Spread cm<sup>3</sup> : 0.2  
 100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Del. quantity : 89.5...90.5  
 1000 : (87.5...92.5)  
 Spread cm<sup>3</sup> : 3.00  
 1000 : (5.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 39...47

Testing:  
 1st rack travel in: 10.20  
 Speed rpm : 1140...1150

2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
3rd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 1375  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 9.3  
Speed rpm : 325  
Rack travel in mm : 9.70...9.90  
Rack travel in mm : 2.00  
Speed rpm : 480...540

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 500  
Rack travel in m: 11.20...11.40

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 115.0  
1000 s: ( 112.0)  
Rack travel in mm : 16.80...21.00

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 1 g 31  
Edition : 22.05.87  
Replaces : 9.3.87  
Test oil : ISO-4113

Combination no. : 0 400 864 069

Injection pump  
Pump designation : PES4A85D410/3RS2732  
EP type number : 0 410 884 947  
Governor  
Governor design. : RSV325...1175A8C2163  
-3L  
Governor no. : 0 420 232 474

Customer-spec. information  
Customer : KHD

Engine : F4L913

1st version kW : 55.0  
Rated speed : 2350

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
: (2.45...2.65)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance +/- ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1175

---

Rack travel in mm : 9.80...9.90

---

Del.quantity cm<sup>3</sup>/ : 6.7...6.8

---

100 s : (6.5...7.0)

---

Spread cm<sup>3</sup> : 0.3

---

100 s : (0.4)

2nd speed rpm : 325.0  
Rack travel in mm : 6.3...6.5  
Del.quantity cm<sup>3</sup>/ : 1.0...1.6  
100 s : (0.8...1.8)

Spread cm<sup>3</sup> : 0.2  
100 s : (0.4)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : 4.25

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1175  
Del.quantity : 67.0...68.0  
1000 : (65.0...70.0)

Spread cm<sup>3</sup> : 3.00  
1000 : (4.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 53...61

Testing:  
1st rack travel in: 8.80  
Speed rpm : 1215...1225  
2nd rack travel in: 4.00  
Speed rpm : 1235...1265  
3rd rack travel in: 4.00

Speed rpm : 1255...1285  
4th Rack travel in: 1420  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 15...23  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 325  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 460...520

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1175  
Rack travel in m: 9.80...9.90  
2nd speed rpm : 500  
Rack travel in m: 10.30...10.40  
3rd speed rpm : 800  
Rack travel in m: 10.20...10.30

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 58.0...60.0  
1000 s: (55.5...62.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.80  
Speed rpm : 1215...1225

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 17.10...17.30

Remarks:

: TKS 2.80

#### APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FOR 5,9 f 5  
 Edition : 27.03.87  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 109  
 Injection pump  
 Pump designation : PES6A90D210RS2629  
 EP type number : 0 410 896 075  
 Governor  
 Governor design. : RSV350...1300A0C2139  
 L  
 Governor no. : 0 420 232 374

Customer-spec. information  
 Customer : FORD/GB

Engine : 380

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.00  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1250  
 Rack travel in mm : 12.90...13.00  
 Del.quantity cm3/ : 7.2...7.3  
 100 s: (7.0...7.5)  
 Spread cm3 : 0.3  
 100 s: (0.4)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 6.4...6.5  
 Del.quantity cm3/ : 0.9...1.3  
 100 s: (0.7...1.5)  
 Spread cm3 : 0.2  
 100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Del.quantity : 72.0...73.0  
 1000 : (70.0...75.0)  
 Spread cm3 : 3.00  
 1000 : (4.50)

RATED SPEED

1st version  
 Control lever  
 position degrees: 64...72

Testing:  
 1st rack travel in: 11.90  
 Speed rpm : 1365...1375  
 2nd rack travel in: 4.00  
 Speed rpm : 1480...1510  
 3rd rack travel in: 4.00  
 Speed rpm : 1505...1535  
 4th rack travel in: 1670  
 Speed rpm : 0.30...1.70

LOW IDLE 1  
 Control lever

position degrees: 30...38  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.0

Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 350  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 515...575  
Speed rpm : 650  
Maximum rack trave: 1.00

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 1365...1375

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 76.0...90.0  
1000 s: (73.0...93.0)  
Rack travel in mm : 19.00...21.00

Remarks:

:

At start of delivery, locating pin  
must latch into slit in pointer.

**BOSCH INJ. PUMP TEST SPECIFICATIONS****Note remarks**

Test sheet : KHD 1 g 24  
 Edition : 07.02.89  
 Replaces : 9.3.87  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 118  
 Injection pump  
 Pump designation : PES6A85D410/3RS2611  
 EP type number : 0 410 886 902  
 Governor  
 Governor design. : RSV325...1150A8C604L  
 Governor no. : 0 420 232 319

Customer-spec. information  
 Customer : KHD

Engine : F6L913

1st version kW : 78.0  
 Rated speed : 2300

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
 : (2.45...2.65)  
 Rack travel in mm : 9.00...12.00

E01

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1150

Rack travel in mm : 10.20...10.30

Del. quantity cm<sup>3</sup>/ : 6.0...6.1

100 s : (5.8...6.3)

Spread cm<sup>3</sup> : 0.3

100 s : (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 8.4...8.6

Del. quantity cm<sup>3</sup>/ : 1.0...1.6

100 s : (0.8...1.8)

Spread cm<sup>3</sup> : 0.2

100 s : (0.4)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1150

Del. quantity : 60.5...61.5

1000 : (58.5...63.5)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

**RATED SPEED**

1st version

Control lever

position degrees: 49...57

Testing:

1st rack travel in: 9.20

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1215...1245

3rd rack travel in: 4.00

Speed rpm : 1240...1270



4th rack travel in: 1400  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 8.0

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 325  
Rack travel in mm : 8.40...8.60  
Rack travel in mm : 2.00  
Speed rpm : 440...500

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 500  
Rack travel in m: 10.20...10.40

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm3/ : 39.5...41.5  
1000 s: (37.0...44.0)  
Speed rpm : 800  
Del.quantity cm3/ : 48.0...50.0  
1000 s: (45.5...52.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 k 2  
Edition : 15.06.88  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 866 124  
Injection pump  
Pump designation : PES6A100D320/3RS2691  
EP type number : 9 410 230 025  
Governor  
Governor design. : RSV400...1250AOC2216  
-2R  
Governor no. : 0 420 233 217

Customer-spec. information  
Customer : C.D.C.

Engine : 6 CT 830

1st version kW : 160.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

EO3

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 12.1...12.3

100 s : (11.9...12.5)

Spread cm<sup>3</sup> : 0.3

100 s : (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.7...5.9

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s : (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s : (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 121.0...123.0

1000 : (119.0...125.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 58...66

Testing:

1st rack travel in: 11.00  
Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1395...1425  
4th rack travel in: 1500  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 33...41  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.3

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 2.00  
Speed rpm : 510...570

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 750  
Rack travel in m: 12.40...12.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 122.0...126.0  
1000 s: (120.0...128.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1290...1300

#### INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400

E04

Rack travel in mm : 5.70...5.90  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 L  
Edition : 20.12.88  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 866 128  
Injection pump  
Pump designation : PES6A100D32G/3RS2763  
EP type number : 0 410 806 006  
Governor  
Governor design. : RSV410...950AOC2190-  
26R  
Governor no. : 0 420 233 224

Customer-spec. information  
Customer : C.D.C.

Engine : 6 CT

1st version kW : 138.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

E05

Prestroke mm : 2.80...2.90  
                  : (2.75...3.00)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 950

Rack travel in mm : 9.60...9.70

Del.quantity cm<sup>3</sup>/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 410.0  
Rack travel in mm : 5.0...5.2  
Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 950

Del.quantity : 84.5...86.5

1000 : (82.5...88.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 40...48

Testing:

1st rack travel in: 8.60  
Speed rpm : 1010...1020  
2nd rack travel in: 4.00  
Speed rpm : 1050...1080  
4th rack travel in: 1150  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 24...32  
Setting point w/out bumper spring  
Speed rpm : 410  
Rack travel in mm : 4.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 410  
Rack travel in mm : 5.00...5.20  
Rack travel in mm : 2.00  
Speed rpm : 455...515

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 950  
Rack travel in m: 9.60...9.70  
2nd speed rpm : 650  
Rack travel in m: 10.70...10.90

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 99.0...103.0  
1000 s: (97.0...105.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.60  
Speed rpm : 1010...1020

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...170.0  
1000 s: (145.0...175.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 410  
Rack travel in mm : 5.00...5.20  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)

Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 L 1  
Edition : 20.12.88  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 866 129  
Injection pump  
Pump designation : PES6A100D320/3RS2763  
EP type number : 0 410 806 006  
Governor  
Governor design. : RSV400...1050AOC2190  
-27R  
Governor no. : 0 420 233 225

Customer-spec. information  
Customer : C.D.C.

Engine : 6CT 8.3

1st version kW : 111.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.20...10.30

Del.quantity cm<sup>3</sup>/ : 8.7...8.9

100 s : (8.5...9.1)

Spread cm<sup>3</sup> : 0.3

100 s : (0.6)

2nd speed rpm : 400.0  
Rack travel in mm : 5.3...5.5  
Del.quantity cm<sup>3</sup>/ : 1.1...1.5  
100 s : (0.9...1.8)

Spread cm<sup>3</sup> : 0.3  
100 s : (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 87.0...89.0

1000 : (85.0...91.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 46...54

Testing:

1st rack travel in: 9.20  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1205...1235  
3rd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 25...33  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.9

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.00  
Speed rpm : 470...530

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 750  
Rack travel in m: 11.30...11.50

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 99.0...103.0  
1000 s: (97.0...105.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...170.0  
1000 s: (145.0...175.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.30...5.50

E08

Del.quantity cm<sup>3</sup>/ : 11.5...15.5  
1000 s: (9.0...18.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : CUM 8,3 m  
Edition : 20.12.88  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 400 866 131

Injection pump  
Pump designation : PES6A100D320/3RS2691  
EP type number : 9 410 230 025  
Governor  
Governor design. : RSV425...900A4C2213-2R  
Governor no. : 0 420 233 230

Cust. part no. : 3914869

Customer-spec. information  
Customer : C.D.C.

Engine : 6 CT 8.3

1st version kW : 154.0  
Rated speed : 1800

### TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
                  : (2.75...2.95)

Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 830

---

Rack travel in mm : 13.40...13.50

---

Del. quantity cm<sup>3</sup>/ : 13.5...13.7

---

100 s: (13.3...13.9)

---

Spread cm<sup>3</sup> : 0.3

---

100 s: (0.6)

2nd speed rpm : 425.0  
Rack travel in mm : 5.5...5.7  
Del. quantity cm<sup>3</sup>/ : 1.2...1.6  
100 s: (0.9...1.8)

Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

### GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3

Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : ?

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 830  
Del. quantity : 135.0...137.0  
1000 : (133.0...139.0)

Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

### RATED SPEED

1st version  
Control lever  
position degrees: 44...48



Testing:  
1st rack travel in: 12.40  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 960...990  
3rd rack travel in: 4.00  
4th rack travel in: 1030  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 20...28  
Setting point w/out bumper spring  
Speed rpm : 425  
Rack travel in mm : 5.0

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 425  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 435...495

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.40  
Speed rpm : 925...935

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 425  
Rack travel in mm : 5.50...5.70  
Del. quantity cm<sup>3</sup>/ : 12.0...16.0  
1000 s: (9.5...18.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

E10

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 m 1  
 Edition : 20.12.88  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 138  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV425...750A4C2213-  
 3R  
 Governor no. : 0 420 233 235

Customer-spec. information  
 Customer : C.D.C.

Engine : 6CT- 8.3 L

1st version kW : 135.0  
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness : 6.00X2.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 14.00...14.10

Del.quantity cm<sup>3</sup>/ : 14.2...14.4

100 s: (14.0...14.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 425.0  
 Rack travel in mm : 6.0...6.2  
 Del.quantity cm<sup>3</sup>/ : 1.8...2.2  
 100 s: (1.5...2.4)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 750  
 Del.quantity : 142.5...144.5  
 1000 : (140.5...146.5)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 37...45

Testing:

1st rack travel in: 13.00  
Speed rpm : 795...805  
2nd rack travel in: 4.00  
Speed rpm : 825...855  
3rd rack travel in: 4.00  
Speed rpm : 830...860

Generator

LOW IDLE 1  
Control lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 425  
Rack travel in mm : 5.6

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 425  
Rack travel in mm : 6.00...6.20  
Rack travel in mm : 2.00  
Speed rpm : 440...500

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 795...805

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 425  
Rack travel in mm : 6.00...6.20  
Del.quantity cm<sup>3</sup>/ : 18.0...22.0  
1000 s: (15.5...24.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

Adjust stop lever to 0.5...1.0 mm  
before stop.

APPLICATION

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : CUM 8,3 l 2  
 Edition : 20.12.88  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 139  
 Injection pump  
 Pump designation : PES6A100D320/3RS2763  
 EP type number : 0 410 806 006  
 Governor  
 Governor design. : RSV400...1250A0C2190  
 -32R  
 Governor no. : 0 420 233 236

Customer-spec. information  
 Customer : CDC

Engine : 6 CT 8.3 ltr

1st version kW : 114.0  
 Rated speed : 2500

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 457 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1250

Rack travel in mm : 9.20...9.30

Del.quantity cm<sup>3</sup>/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.1...5.3

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1250

Del.quantity : 84.0...86.0

1000 : (82.0...88.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

**RATED SPEED**

1st version

Control lever

position degrees: 53...61

Testing:

1st rack travel in: 8.20  
Speed rpm : 1310...1320  
2nd rack travel in: 4.00  
Speed rpm : 1345...1375  
3rd rack travel in: 4.00  
Speed rpm : 1350...1380  
4th rack travel in: 1450  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 28...36  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 480...540

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 9.20...9.30  
2nd speed rpm : 800  
Rack travel in m: 9.60...9.80

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 80.5...84.5  
1000 s: (78.5...86.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.20  
Speed rpm : 1310...1320

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.10...5.30

Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 5,9 v  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 143  
 Injection pump  
 Pump designation : PES6A95D120RS2773  
 EP type number : 0 410 896 904  
 Governor  
 Governor design. : RSV350...1250A2C2237  
 R  
 Govenner no. : 0 420 233 240  
 Customer-spec. information  
 Customer : CUMMINS  
 Engine : 6BT  
 1st version kw : 118.0  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 017  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

E15

Prestroke mm : 2.10...2.20  
 : (2.05...2.25)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1250  
 Rack travel in mm : 9.40...9.50  
 Del.quantity cm3/ : 8.8...9.0  
 100 s: (8.6...9.3)  
 Spread cm3 : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.4...5.6  
 Del.quantity cm3/ : 1.6...2.2  
 100 s: (1.3...2.4)  
 Spread cm3 : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Del.quantity : 88.5...90.5  
 1000 : (86.0...93.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 39...47

Testing:  
 1st rack travel in: 8.40  
 Speed rpm : 1290...1300

2nd rack travel in: 4.00  
Speed rpm : 1355...1385  
3rd rack travel in: 4.00  
Speed rpm : 1365...1395  
4th rack travel in: 1530  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 20...28  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 465...525

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 9.40...9.50  
2nd speed rpm : 500  
Rack travel in m: 9.40...9.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm3/ : 77.0...80.0  
1000 s: (75.0...82.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.40  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 110.0...120.0  
1000 s: (107.0...123.0)  
Rack travel in mm : 14.10...14.50

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 16.0...22.0  
1000 s: (13.5...24.5)

Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark = 12,5° after  
start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5,6 a 1  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 874 238A  
 Injection pump  
 Pump designation : PES4A95D41ORS2685  
 EP type number : 0 410 894 996  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 L  
 Governor no. : 0 420 232 387

Customer-spec. information  
 Customer : LIEBHERR

Engine : D904 NA

1st version kW : 60.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 9.00...9.10

Del.quantity cm<sup>3</sup>/ : 7.5...7.7

100 s: (7.3...7.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 6.3...6.5

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 75.0...77.0

1000 : (73.0...79.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 39...47



Testing:

1st rack travel in: 8.00  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1045...1075  
3rd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1240  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 510...570

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 9.00...9.10  
2nd speed rpm : 500  
Rack travel in m: 9.00...9.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm3/ : 62.5...65.5  
1000 s: (60.0...68.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.00  
Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : LIE 5,6 a 2  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 874 238B  
 Injection pump  
 Pump designation : PES4A95D410RS2685  
 EP type number : 0 410 894 996  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 L  
 Govenner no. : 0 420 232 387

Customer-spec. information  
 Customer : LIEBHERR

Engine : D904 NA

1st version kW : 70.0  
 Rated speed : 2000

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 40...45

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

**BASIC SETTING**

1st speed rpm : 1000

Rack travel in mm : 10.20...10.30

Del.quantity cm<sup>3</sup>/ : 8.6...8.8

100 s: (8.4...9.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 6.3...6.5

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1000

Del.quantity : 86.0...88.0

1000 : (84.0...90.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

**RATED SPEED**

1st version

Control lever

position degrees: 39...47

Testing:

1st rack travel in: 9.20  
 Speed rpm : 1040...1050  
 2nd rack travel in: 4.00  
 Speed rpm : 1045...1075  
 3rd rack travel in: 4.00  
 Speed rpm : 1075...1105  
 4th rack travel in: 1240  
 Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
 position degrees: 13...21  
 Setting point w/out bumper spring  
 Speed rpm : 400  
 Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
 Minimum rack trave: 19.50  
 Speed rpm : 400  
 Rack travel in mm : 6.30...6.50  
 Rack travel in mm : 2.00  
 Speed rpm : 510...570

TORQUE CONTROL

Torque control curve - 1st version  
 1st speed rpm : 1000  
 Rack travel in m: 10.20...10.30  
 2nd speed rpm : 500  
 Rack travel in m: 10.20...10.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
 Del.quantity cm3/ : 80.5...83.5  
 1000 s: (78.0...86.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.20  
 Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
 Del.quantity cm3/ : 120.0...130.0  
 1000 s: (117.0...133.0)  
 Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400  
 Rack travel in mm : 6.30...6.50  
 Del.quantity cm3/ : 10.0...16.0  
 1000 s: (7.5...18.5)  
 Spread cm3 : 3.50  
 1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5,6 a 3  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 874 238D  
Injection pump  
Pump designation : PES4A95D410RS2685  
EP type number : 0 410 894 996  
Governor  
Governor design. : RSV400...1000A1C2187  
Governor no. : 0 420 232 387

Customer-spec. information  
Customer : LIEBHERR

Engine : D904 NA

1st version kW : 62.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 40...45

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
: (2.65...2.85)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
& maximum rack tra: 21.00  
Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 9.90...10.00

Del. quantity cm<sup>3</sup>/ : 7.7...7.9

100 s: (7.5...8.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0  
Rack travel in mm : 6.3...6.5  
Del. quantity cm<sup>3</sup>/ : 1.0...1.6  
100 s: (0.7...1.8)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3

Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : 3.25

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Del. quantity : 77.0...79.0  
1000 : (75.0...81.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 44...52

Testing:

1st rack travel in: 8.90  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1055...1085  
3rd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1240  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 17...25  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 520...580

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 9.90...10.00  
2nd speed rpm : 500  
Rack travel in m: 10.60...10.70  
3rd speed rpm : 890  
Rack travel in m: 10.30...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 825  
Del.quantity cm3/ : 82.5...85.5  
1000 s: (80.0...88.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.90  
Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE 5,6 a 4  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 874 238E  
 Injection pump  
 Pump designation : PES4A95D410RS2685  
 EP type number : 0 410 894 996  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 L  
 Governor no. : 0 420 232 387

Customer-spec. information  
 Customer : LIEBHERR

Engine : D904 TB

1st version kW : 77.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45  
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27 :

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.20...11.30

Del.quantity cm<sup>3</sup>/ : 9.9...10.1

100 s: (9.7...10.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 6.3...6.5

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 99.0...101.0

1000 : (97.0...103.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 42...50

Testing:  
1st rack travel in: 10.20  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1050...1080  
3rd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1235  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control Lever  
position degrees: 15...23  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 515...575

TORQUE CONTROL  
Dimension a mm : 1.15  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 11.20...10.30  
2nd speed rpm : 500  
Rack travel in m: 12.40...12.50  
3rd speed rpm : 820  
Rack travel in m: 11.70...11.90

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 112.0...115.0  
1000 s: (109.5...117.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED  
Rack travel in mm : 4.00

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : LIE 5,6 a 5  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 874 238F  
 Injection pump  
 Pump designation : PES4A95D410RS2685  
 EP type number : 0 410 894 996  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 L  
 Governor no. : 0 420 232 387

Customer-spec. information  
 Customer : LIEBHERR

Engine : D904 T

1st version kW : 81.0  
 Rated speed : 2000

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 40...45

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

**BASIC SETTING**

1st speed rpm : 1000

Rack travel in mm : 12.10...12.20

Del.quantity cm<sup>3</sup>/ : 11.3...11.5

100 s: (11.1...11.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 6.3...6.5

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.75

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1000

Del.quantity : 113.0...115.0

1000 : (111.0...117.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

**RATED SPEED**

1st version

Control lever

position degrees: 42...50



Testing:

1st rack travel in: 11.10  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1050...1080  
3rd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1245  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever  
position degrees: 15...23  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 515...575

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 500  
Rack travel in m: 12.60...12.60  
3rd speed rpm : 880  
Rack travel in m: 12.30...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 900  
Del.quantity cm3/ : 121.0...124.0  
1000 s: (118.5...126.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5,6 a 6  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 874 238G  
Injection pump  
Pump designation : PES4A95D410RS2685  
EP type number : 0 410 894 996  
Governor  
Governor design. : RSV400...1000A1C2187  
Governor no. : 0 420 232 387  
Customer-spec. information  
Customer : LIEBHERR  
Engine : D904 T  
1st version kW : 88.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 40...45  
Overflow valve : 1 417 413 000  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 0 681 343 009  
Opening  
pressure, bar : 172...175  
Test lines : 1 680 750 008  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600  
(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
Prestroke mm : 2.70...2.80  
: (2.65...2.85)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
& maximum rack tra: 21.00  
Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1000  
Rack travel in mm : 13.00...13.10  
Del. quantity cm<sup>3</sup>/ : 12.5...12.7  
100 s: (12.3...12.9)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.6)

2nd speed rpm : 400.0  
Rack travel in mm : 6.3...6.5  
Del. quantity cm<sup>3</sup>/ : 1.0...1.6  
100 s: (0.7...1.8)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : 2.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Del. quantity : 125.0...127.0  
1000 : (123.0...129.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 40...48

Testing:  
1st rack travel in: 12.00  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1045...1075  
3rd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1245  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control Lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 510...570

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 500  
Rack travel in m: 13.00...13.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 113.5...116.5  
1000 s: (111.0...119.0)  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 119.0...122.0  
1000 s: (116.5...124.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.00  
Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED  
Rack travel in mm : 4.00

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5,6 a 7  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 874 238H  
Injection pump  
Pump designation : PES4A95D41ORS2685  
EP type number : 0 410 894 996  
Governor  
Governor design. : RSV400...1000A1C2187  
Governor no. : 0 420 232 387  
Customer-spec. information  
Customer : LIEBHERR  
Engine : D904 TB  
1st version kW : 67.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 40...45  
Overflow valve : 1 417 413 000  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 0 681 343 009  
Opening  
pressure, bar : 172...175  
Test lines : 1 680 750 008  
Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600  
(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
Prestroke mm : 2.70...2.80  
: (2.65...2.85)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
& maximum rack tra: 21.00  
Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1000  
Rack travel in mm : 10.50...10.60  
Del. quantity cm<sup>3</sup>/ : 9.2...9.4  
100 s: (9.0...9.6)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.6)

2nd speed rpm : 400.0  
Rack travel in mm : 6.3...6.5  
Del. quantity cm<sup>3</sup>/ : 1.0...1.6  
100 s: (0.7...1.8)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : 2.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Del. quantity : 92.0...94.0  
1000 : (90.0...96.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 41...49

Testing:  
1st rack travel in: 9.50  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1045...1075  
3rd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1240  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 14...22  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 515...575

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 500  
Rack travel in m: 10.90...11.00  
3rd speed rpm : 900  
Rack travel in m: 10.70...10.90

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 98.0...101.0  
1000 s: (95.5...103.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.50  
Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED  
Rack travel in mm : 4.00

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)

Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5,6 a 8  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 874 238J  
Injection pump  
Pump designation : PES4A95D41ORS2685  
EP type number : 0 410 894 996  
Governor  
Governor design. : RSV400...1000A1C2187  
Governor no. : 0 420 232 387

Customer spec. information  
Customer : LIEBHERR

Engine : D904 T

1st version kW : 90.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 40...45

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
: (2.65...2.85)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
& maximum rack tra: 21.00  
Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del. quantity cm<sup>3</sup>/ : 12.1...12.3  
100 s: (11.9...12.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0  
Rack travel in mm : 6.3...6.5  
Del. quantity cm<sup>3</sup>/ : 1.0...1.6  
100 s: (0.7...1.8)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3

Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : 2.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Del. quantity : 121.5...123.5  
1000 : (119.5...125.5)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 40...48

Testing:

1st rack travel in: 11.50  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1050...1080  
3rd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1245  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.5  
Rack travel in mm : 2.00  
Speed rpm : 510...570

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 500  
Rack travel in m: 12.50...12.70

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE 8,4 a 1  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 876 322A  
 Injection pump  
 Pump designation : PES6A95D41ORS2689  
 EP type number : 0 410 896 916  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 Governor no. : 0 420 232 387

Customer-spec. information  
 Customer : LIEBHERR

Engine : D906 NA

1st version kW : 112.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

F05

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.40...10.50

Del.quantity cm<sup>3</sup>/ : 8.7...8.9

100 s: (8.5...9.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 6.3...6.5  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.6  
 100 s: (0.7...1.8)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Del.quantity : 87.0...89.0  
 1000 : (85.0...91.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 39...47



Testing:

1st rack travel in: 9.40  
 Speed rpm : 1040...1050  
 2nd rack travel in: 4.00  
 Speed rpm : 1045...1075  
 3rd rack travel in: 4.00  
 Speed rpm : 1075...1105  
 4th rack travel in: 1240  
 Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever  
 position degrees: 13...21  
 Setting point w/out bumper spring  
 Speed rpm : 400  
 Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
 Minimum rack trave: 19.50  
 Speed rpm : 400  
 Rack travel in mm : 6.30...6.50  
 Rack travel in mm : 2.00  
 Speed rpm : 515...575

TORQUE CONTROL

Torque control curve - 1st version  
 1st speed rpm : 1000  
 Rack travel in m: 10.40...10.50  
 2nd speed rpm : 500  
 Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
 Del.quantity cm3/ : 77.5...80.5  
 1000 s: (75.0...83.0)

BREAKAWAY

1st version

1mm rack travel less than  
 full load rack tr: 9.40  
 Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
 Del.quantity cm3/ : 120.0...130.0  
 1000 s: (117.0...133.0)  
 Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400  
 Rack travel in mm : 6.30...6.50  
 Del.quantity cm3/ : 10.0...16.0  
 1000 s: (7.5...18.5)  
 Spread cm3 : 3.50  
 1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE 8,4 a 2
Edition : 07.02.89
Replaces : -
Test oil : ISO-4113
Combination no. : 0 400 876 322B
Injection pump
Pump designation : PES6A95D410RS2689
EP type number : 0 410 896 916
Governor
Governor design. : RSV400...1000A1C2187
Governor no. : 0 420 232 387

Customer-spec. information
Customer : LIEBHERR

Engine : D906 TB

1st version kW : 118.0
Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 40...45

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
x Wall thickness : 6.00X2.00X600
x Length mm

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80
: (2.65...2.85)

F07

Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
& maximum rack tra: 21.00
Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.20...11.30

Del. quantity cm3/ : 9.9...10.1

100 s: (9.7...10.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 6.3...6.5

Del. quantity cm3/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del. quantity : 99.0...101.0

1000 : (97.0...103.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 39...47

Testing:

1st rack travel in: 10.20  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1045...1075  
3rd rack travel in: 4.00  
Speed rpm : 1060...1090  
4th rack travel in: 1225  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 510...570

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 500  
Rack travel in m: 12.40...12.50  
3rd speed rpm : 870  
Rack travel in m: 11.80...12.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750  
Del.quantity cm3/ : 113.0...116.0  
1000 s: (110.5...118.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.20  
Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

F08

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE 8,4 a 3
Edition : 07.02.89
Replaces : -
Test oil : ISO-4113
Combination no. : 0 400 876 322C
Injection pump
Pump designation : PES6A95D410RS2689
EP type number : 0 410 896 916
Governor
Governor design. : RSV400...1000A1C2187
Governor no. : 0 420 232 387

Customer-spec. information
Customer : LIEBHERR

Engine : D906 T

1st version kW : 132.0
Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 40...45

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80
: (2.65...2.85)

F09

Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
& maximum rack tra: 21.00
Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 11.5...11.7

100 s: (11.3...11.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 6.3...6.5

Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 115.0...117.0

1000 : (113.0...119.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 40...48

Testing:

1st rack travel in: 11.10  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1045...1075  
3rd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1240  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever  
position degrees: 14...22  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 530...590

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 500  
Rack travel in m: 12.40...12.50  
3rd speed rpm : 910  
Rack travel in m: 12.20...12.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800  
Del.quantity cm3/ : 118.0...121.0  
1000 s: (115.5...123.5)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.10  
Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 6,0 c 2  
 Edition : 03.03.89  
 Replaces : 24.6.88  
 Test oil : ISO-4113

Combination no. : 0 400 876 335

Injection pump  
 Pump designation : PES6A90D410RS2710  
 EP type number : 0 410 896 D82  
 Governor  
 Governor design. : RSV350...1200A1C1154  
 L  
 Governor no. : 0 420 232 468

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM 366

1st version kW : 74.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35  
 : (2.20...2.40)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1200

---

Rack travel in mm : 9.30...9.40

---

Del.quantity cm<sup>3</sup>/ : 5.1...5.2  
 100 s: (4.9...5.4)

---

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.4)

---

2nd speed rpm : 370.0  
 Rack travel in mm : 7.9...8.5  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.2  
 100 s: (0.8...1.4)

Spread cm<sup>3</sup> : 0.2  
 100 s: (0.4)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 5.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1200  
 Del.quantity : 51.0...52.0  
 1000 : (49.0...54.0)

Spread cm<sup>3</sup> : 3.00  
 1000 : (4.50)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 59...67  
 2nd rack travel in: 8.30  
 Speed rpm : 1250...1245  
 3rd rack travel in: 4.00  
 Speed rpm : 1267...1280  
 4th rack travel in: 1400  
 Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: -3  
Setting point w/out bumper spring  
Speed rpm : 370  
Rack travel in mm : 8.2

Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 370  
Rack travel in mm : 8.10...8.30  
Rack travel in mm : 2.00  
Speed rpm : 460...520

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 9.30...9.40  
2nd speed rpm : 600  
Rack travel in m: 10.00...10.20  
3rd speed rpm : 900  
Rack travel in m: 9.80...10.10

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm3/ : 41.0...43.0  
1000 s: (38.5...45.5)  
Speed rpm : 900  
Del.quantity cm3/ : 46.0...49.0  
1000 s: (43.5...51.5)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 85.0...95.0  
1000 s: (82.0...98.0)  
Rack travel in mm : 16.80...17.20

LOW IDLE

Speed rpm : 370  
Rack travel in mm : 7.90...8.50  
Del.quantity cm3/ : 10.0...12.0  
1000 s: (8.0...14.0)  
Spread cm3 : 2.50  
1000 s: (4.50)

Remarks:

:

APPLICATION

Unimog

F12

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 c 3  
Edition : 03.03.89  
Replaces : 2.9.88  
Test oil : ISO-4113

Combination no. : 0 400 876 336

Injection pump  
Pump designation : PES6A90D410RS2710  
EP type number : 0 410 896 082  
Governor  
Governor design. : RSV350...1200A1C1154  
-1L  
Governor no. : 0 420 232 470

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM 366

1st version kW : 81.0  
Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35  
: (2.20...2.40)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200

---

Rack travel in mm : 9.80...9.90

---

Del.quantity cm<sup>3</sup>/ : 5.3...5.4

---

100 s: (5.1...5.6)

---

Spread cm<sup>3</sup> : 0.3

---

100 s: (0.4)

2nd speed rpm : 370.0  
Rack travel in mm : 7.8...8.4  
Del.quantity cm<sup>3</sup>/ : 1.0...1.2  
100 s: (0.8...1.4)

Spread cm<sup>3</sup> : 0.2  
100 s: (8.4)

GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1200  
Del.quantity : 53.0...54.0  
1000 : (51.0...56.0)

Spread cm<sup>3</sup> : 3.00  
1000 : (4.50)

RATED SPEED

1st version  
Control lever  
position degrees: 59...67

Testing:  
1st rack travel in: 8.80  
Speed rpm : 1240...1245  
3rd rack travel in: 4.00  
Speed rpm : 1295...1325  
4th rack travel in: 1400



Speed rpm : 0.30...1.40

APPLICATION

LOW IDLE 1

Unimog

Control lever  
position degrees: -3  
Setting point w/out bumper spring  
Speed rpm : 370  
Rack travel in mm : 8.1

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 370  
Rack travel in mm : 8.00...8.20  
Rack travel in mm : 2.00  
Speed rpm : 470...530

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 9.80...9.90  
2nd speed rpm : 600  
Rack travel in m: 11.30...11.40  
3rd speed rpm : 850  
Rack travel in m: 11.10...11.30  
4th speed rpm : 950  
Rack travel in m: 10.30...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 50.0...52.0  
1000 s: (47.5...54.5)  
Speed rpm : 850  
Del. quantity cm<sup>3</sup>/ : 51.0...54.0  
1000 s: (48.5...56.5)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 85.0...95.0  
1000 s: (82.0...98.0)  
Rack travel in mm : 17.10...17.50

LOW IDLE

Speed rpm : 370  
Rack travel in mm : 7.80...8.40  
Del. quantity cm<sup>3</sup>/ : 10.0...12.0  
1000 s: (8.0...14.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (84.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RAB 9,7 d 1  
 Edition : 13.05.87  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 400 876 340

Injection pump  
 Pump designation : PES6A95D41ORS2108R  
 EP type number : 0 410 896 927  
 Governor  
 Governor design. : RSV550...1100A1C607-  
 1L  
 Governor no. : 0 420 232 486

Customer-spec. information  
 Customer : RABA

Engine : D2356 HM6

1st version kW : 150.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1080

---

Rack travel in mm : 13.40...13.50

---

Del.quantity cm<sup>3</sup>/ : 12.2...12.4  
 100 s: (12.0...12.6)

---

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 550.0  
 Rack travel in mm : 6.9...7.1  
 Del.quantity cm<sup>3</sup>/ : 1.3...1.9  
 100 s: (1.0...2.1)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1080  
 Del.quantity : 122.0...124.0  
 1000 : (120.0...126.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 48...56

Testing:  
 1st rack travel in: 12.40  
 Speed rpm : 1120...1130  
 2nd rack travel in: 4.00

Speed rpm : 1145...1175  
3rd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1340  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 24...32  
Setting point w/out bumper spring  
Speed rpm : 550  
Rack travel in mm : 6.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 550  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 635...695

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1080  
Rack travel in m: 13.40...13.50  
2nd speed rpm : 400  
Rack travel in m: 13.40...13.60  
3rd speed rpm : 250  
Rack travel in m: 14.60...15.20

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 0.0...124.5  
1000 s: (0.0...127.0)  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 120.0...123.0  
1000 s: (117.5...125.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 12.40  
Speed rpm : 1120...1130

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RAB 10,8 b  
 Edition : 10.02.89  
 Replaces : 12.9.86  
 Test oil : ISO-4113  
 Combination no. : 0 401 246 013  
 Injection pump  
 Pump designation : PES6A100D410RS3039  
 EP type number : 0 411 206 018  
 Governor  
 Governor design. : RQ200/1100AB1215L  
 Governor no. : 0 420 200 102

Customer-spec. information  
 Customer : RABA

Engine : D2156 MTKLL 6

1st version kW : 206.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.60...1.70  
 : (1.55...1.75)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.40...13.50

Del.quantity cm<sup>3</sup>/ : 15.0...15.2

100 s: (14.8...15.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 200.0

Rack travel in mm : 6.7...6.9

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 700

Del.quantity : 150.0...152.0

1000 : (148.0...154.0)

Spread cm<sup>3</sup> : 3.00

1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.50

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1205...1235

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 200

Rack travel in mm : 6.8

Testing:

Speed rpm : 100

Minimum rack trave: 8.20

Speed rpm : 200

Rack travel in mm : 6.70...6.90

Rack travel in mm : 2.00

Speed rpm : 325...365

TORQUE CONTROL

Dimension a mm : 0.55

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 13.40...13.50

2nd speed rpm : 600

Rack travel in m: 14.70...14.80

3rd speed rpm : 880

Rack travel in m: 14.00...14.20

4th speed rpm : 945

Rack travel in m: 13.50...13.80

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 700

Rack travel mm : 14.60...14.80

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 10.70...10.80

2nd pressure hPa : 450

Rack travel in m: 13.70...13.80

3rd pressure hPa : 325

Rack travel in m: 12.10...12.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 750

Del.quantity cm3/ : 163.0...166.0

1000 s: (160.5...168.5)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 92.5...94.5

1000 s: (90.5...96.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.50

Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 205.0...215.0

1000 s: (202.0...218.0)

Rack travel in mm : 19.50...21.00

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAN 20,9 j  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 840 109  
 Injection pump  
 Pump designation : PE12P120A520/4LS857  
 EP type number : 0 411 820 035  
 Governor  
 Governor design. : RQV250...1050PA889  
 Governor no. : 0 421 813 696

Customer-spec. information  
 Customer : MAN

Engine : D2542TE60

1st version kw : 361.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 074

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 : 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 : 180-225-240-285-300-  
 Phasing : 345  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

**BASIC SETTING**

1st speed rpm : 1050

Rack travel in mm : 11.80...11.90

Del.quantity cm<sup>3</sup>/ : 14.5...14.7  
 100 s: (14.2...15.0)

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 6.5...6.7  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s: (1.4...2.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250  
 travel mm : 0.80...1.20  
 2nd speed rpm : 700  
 travel mm : 4.60...5.00  
 3rd speed rpm : 1050  
 travel mm : 7.40...7.60  
 4th speed rpm : 1400  
 travel mm : 11.00...12.00

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1125  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1050

Del.quantity : 145.0...147.0  
1000 : (142.0...150.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 58...66

Testing:  
1st rack travel in: 10.80  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.10  
Speed rpm : 250  
Rack travel in mm : 6.50...6.70

CONSTANT REGULATION  
Speed rpm : 400...520

#### START CUT-OUT

Speed 1/min : 190 (210)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.80  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.50...6.70  
Del.quantity cm3/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

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APPLICATION : MAN-NR. 2-7906  
Rail car

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : FIA 13,8 a  
 Edition : 10.02.89  
 Replaces : 1.9.88  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 225  
 Injection pump  
 Pump designation : PE6P120A72ORS167  
 EP type number : 0 411 826 053  
 Governor  
 Governor design. : RQ225/1100PA118  
 Governor no. : 0 421 801 027

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 221A

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 067  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1100  
 Rack travel in mm : 11.10...11.20  
 Del.quantity cm<sup>3</sup>/ : 17.0...17.2  
 100 s: (16.7...17.5)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 225.0  
 Rack travel in mm : 7.5...7.7  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s: (1.4...2.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 600  
 Rack travel in mm : 15.20...16.40

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1100  
 Del.quantity : 170.0...172.0  
 1000 : (167.0...175.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 15.8

Testing:  
 1st rack travel in: 10.10  
 Speed rpm : 1145...1160  
 2nd rack travel in: 4.00  
 Speed rpm : 1195...1225  
 4th rack travel in: 1350



Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 225

Rack travel in mm : 7.6

Testing:

Speed rpm : 100

Minimum rack trave: 9.10

Speed rpm : 225

Rack travel in mm : 7.50...7.70

Rack travel in mm : 2.00

Speed rpm : 365...405

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 11.10...11.20

2nd speed rpm : 600

Rack travel in m: 11.10...11.30

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : FIA 13,8 a6  
 Edition : 10.02.89  
 Replaces : 3.83  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 356  
 Injection pump  
 Pump designation : PE6P120A720RS167  
 EP type number : 0 411 826 053  
 Governor  
 Governor design. : RQ225/1100PA323R  
 Governor no. : 0 421 801 065

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 221A

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 067  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 9.00...12.00

F23

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1100  
 Rack travel in mm : 11.10...11.20  
 Del. quantity cm<sup>3</sup>/ : 17.0...17.2  
 100 s : (16.7...17.5)  
 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)  
 2nd speed rpm : 225.0  
 Rack travel in mm : 7.5...7.7  
 Del. quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s : (1.4...2.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s : (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 550  
 Rack travel in mm : 15.20...16.40

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1100  
 Del. quantity : 170.0...172.0  
 1000 : (167.0...175.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 550  
 Rack travel in mm : 15.8

Testing:  
 1st rack travel in: 10.10  
 Speed rpm : 1145...1160  
 2nd rack travel in: 4.00  
 Speed rpm : 1190...1220  
 4th rack travel in: 1350

Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 225

Rack travel in mm : 7.6

#### Testing:

Speed rpm : 100

Minimum rack trave: 9.10

Speed rpm : 225

Rack travel in mm : 7.50...7.70

Rack travel in mm : 2.00

Speed rpm : 365...405

#### TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 11.10...11.20

2nd speed rpm : 550

Rack travel in m: 11.10...11.30

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : FIA 13,8a10  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 365  
 Injection pump  
 Pump designation : PE6P120A72ORS167  
 EP type number : 0 411 826 053  
 Governor  
 Governor design. : RQ225/1100FA323  
 Governor no. : 0 421 801 065

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 221A

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 9.00...12.00

F25

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1100  
 Rack travel in mm : 11.10...11.20  
 Del. quantity cm<sup>3</sup>/ : 17.0...17.2  
 100 s: (16.7...17.5)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 225.0  
 Rack travel in mm : 7.5...7.7  
 Del. quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s: (1.4...2.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 550  
 Rack travel in mm : 15.20...16.40

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1100  
 Del. quantity : 170.0...172.0  
 1000 : (167.0...175.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 550  
 Rack travel in mm : 15.8

Testing:  
 1st rack travel in: 10.10  
 Speed rpm : 1145...1160  
 2nd rack travel in: 4.00  
 Speed rpm : 1195...1225  
 4th rack travel in: 1350

Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 225

Rack travel in mm : 7.6

#### Testing:

Speed rpm : 100

Minimum rack trave: 9.10

Speed rpm : 225

Rack travel in mm : 7.50...7.70

Rack travel in mm : 2.00

Speed rpm : 365...405

#### TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 11.10...11.20

2nd speed rpm : 550

Rack travel in m: 11.10...11.30

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : FIA 13,8 c  
 Edition : 10.02.89  
 Replaces : 6.85  
 Test oil : ISO-4113

Combination no. : 0 401 846 409

Injection pump  
 Pump designation : PE6P12QA72ORS214  
 EP type number : 0 411 826 060  
 Governor  
 Governor design. : RQV425...1050PA438  
 Governor no. : 0 421 813 273

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8215.22.520

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1050

Rack travel in mm : 10.10...10.20

Del.quantity cm<sup>3</sup>/ : 16.7...16.9

100 s: (16.4...17.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 425.0

Rack travel in mm : 6.2...6.4

Del.quantity cm<sup>3</sup>/ : 2.5...3.1

100 s: (2.2...3.4)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 425  
 travel mm : 1.20...1.40

2nd speed rpm : 600  
 travel mm : 3.80...4.60

3rd speed rpm : 900  
 travel mm : 6.40...6.70

4th speed rpm : 1050  
 travel mm : 7.60...7.80

5th speed rpm : 1400  
 travel mm : 11.00...12.00

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1115

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

**1st version**

Speed rpm : 1050

Del.quantity : 167.0...169.0

1000 : (164.0...172.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 54...62

### Testing:

1st rack travel in: 9.10  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 8...16

### Testing:

Speed rpm : 100  
Minimum rack travel: 7.80  
Speed rpm : 425  
Rack travel in mm : 6.20...6.40

## CONSTANT REGULATION

Speed rpm : 425...525

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.10  
Speed rpm : 1090...1100

## INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

## STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : SCA 8,0 e 1  
 Edition : 09.03.87  
 Replaces : 7.84  
 Test oil : ISO-4113

Combination no. : 0 401 846 423

Injection pump  
 Pump designation : PE6P110A720RS393  
 EP type number : 0 411 816 131  
 Governor  
 Governor design. : RQV250...1200PA469  
 Governor no. : 0 421 813 226

Customer-spec. information  
 Customer : SCANIA

Engine : DN8 01

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 600

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 8.7...8.9

100 s : (8.5...9.1)

Spread cm<sup>3</sup> : 0.5

100 s : (0.7)

2nd speed rpm : 225.0

Rack travel in mm : 6.9...7.1

Del.quantity cm<sup>3</sup>/ : 1.1...1.5

100 s : (-)

Spread cm<sup>3</sup> : 0.2

100 s : (0.4)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 200  
 travel mm : 0.70...0.90

2nd speed rpm : 500  
 travel mm : 3.00...3.50

3rd speed rpm : 800  
 travel mm : 5.10...5.30

4th speed rpm : 1200  
 travel mm : 8.20...8.40

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1200

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 600

Del.quantity : 87.0...89.0

1000 : (85.0...91.0)

Spread cm<sup>3</sup> : 5.00

1000 : (7.00)

**RATED SPEED**

1st version



Control lever  
position degrees: 47...55

Testing:  
1st rack travel in: 11.00  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1325...1355  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.40  
Speed rpm : 225  
Rack travel in mm : 6.90...7.10  
Rack travel in mm : 2.00  
Speed rpm : 335...395

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1200  
Del. quantity cm<sup>3</sup>/ : 98.5...103.5  
1000 s: (96.0...106.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.00  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 140.0...190.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 6.90...7.10  
Del. quantity cm<sup>3</sup>/ : 11.0...15.0  
Spread cm<sup>3</sup> : 2.00  
1000 s: (4.00)

#### Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.

Permissible alteration from 2.20...2.90

#### ADDITIONAL INFORMATION

Check and set without ROBO diaphragam

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on Aug. 22, 1983

Start of delivery - engine: 22° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 8,0 e  
 Edition : 09.03.87  
 Replaces : 7.84  
 Test oil : ISO-4113

Combination no. : 0 401 846 424

Injection pump  
 Pump designation : PE6P110A720RS393  
 EP type number : 0 411 816 131  
 Governor  
 Governor design. : RQV200...1200PA467  
 Governor no. : 0 421 813 224

Customer-spec. information  
 Customer : SCANIA

Engine : DN8 01

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.00...12.10

Del. quantity cm<sup>3</sup>/ : 8.7...8.9

100 s: (8.5...9.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.7)

2nd speed rpm : 225.0

Rack travel in mm : 6.9...7.1

Del. quantity cm<sup>3</sup>/ : 1.1...1.5

100 s: (-)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1200

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Del. quantity : 87.0...89.0

1000 : (85.0...91.0)

Spread cm<sup>3</sup> : 5.00

1000 : (7.00)

RATED SPEED

1st version

Control lever

position degrees: 57...65

Testing:

1st rack travel in: 11.00

Speed rpm : 1240...1250

2nd rack travel in: 4.00

Speed rpm : 1365...1395

4th rack travel in: 1500

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 12...20

Testing:

Speed rpm : 100  
Minimum rack travel: 8.40  
Speed rpm : 225  
Rack travel in mm : 6.90...7.10  
Rack travel in mm : 2.00  
Speed rpm : 440...500

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1200  
Del. quantity cm<sup>3</sup>/ : 98.5...103.5  
1000 s: (96.0...106.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 140.0...190.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225  
Rack travel in mm : 6.90...7.10  
Del. quantity cm<sup>3</sup>/ : 11.0...15.0  
Spread cm<sup>3</sup> : 2.00  
1000 s: (4.00)

Remarks:

:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

ADDITIONAL INFORMATION

Check and set without ROBO diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on Aug. 22, 1983

Start of delivery - engine: 22° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 8,0 n 1  
Edition : 09.03.87  
Replaces : 7.84  
Test oil : ISO-4113

Combination no. : 0 401 846 479

Injection pump  
Pump designation : PE6P110A72ORS393  
EP type number : 0 411 816 131  
Governor  
Governor design. : RQ750PA528  
Governor no. : 0 421 801 126

Customer-spec. information  
Customer : SCANIA

Engine : DN8 01

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
                  : (2.95...3.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.00...12.10

Del. quantity cm<sup>3</sup>/ : 9.0...9.2

100 s: (8.8...9.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.7)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Del. quantity : 90.0...92.0

1000 : (88.0...94.0)

Spread cm<sup>3</sup> : 5.00

1000 : (7.00)

## RATED SPEED

### 1st version

#### Testing:

1st rack travel in: 11.60

Speed rpm : 750...755

2nd rack travel in: 4.00

Speed rpm : 778...788

4th rack travel in: 1500

Speed rpm : 0.00...1.00

## LOW IDLE 1

#### Testing:

Speed rpm : 100

Rack travel in mm : 2.00

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 11.60

Speed rpm : 750...755

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...190.0  
Rack travel in mm : 20.00...21.00

Remarks:

:

#### ADDITIONAL INFORMATION

Check and set without ROBO diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on Aug. 22, 1983

Start of delivery - engine: 22° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

#### APPLICATION

Generator

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : BET 8,8 b 1  
 Edition : 10.02.89  
 Replaces : 12.2.88  
 Test oil : ISO-4113

Combination no. : 0 401 846 489

Injection pump  
 Pump designation : PE6P120A32ORS377  
 EP type number : 0 411 826 108  
 Governor  
 Governor design. : RQV275...1200PA425-2  
 Governor no. : 0 421 813 403

Customer-spec. information  
 Customer : RVI

Engine : MIDS 062030

1st version kW : 158.1  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1200

Rack travel in mm : 12.60...12.70

Del.quantity cm3/ : 15.0...15.2

100 s: (14.7...15.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.1...1.7

100 s: (0.8...2.0)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 275  
 travel mm : 1.00...1.20

2nd speed rpm : 425  
 travel mm : 3.00...3.50

3rd speed rpm : 900  
 travel mm : 5.60...5.90

4th speed rpm : 1200  
 travel mm : 7.60...7.70

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1275

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del.quantity : 150.0...152.0

1000 : (147.0...155.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 60...68

Testing:  
1st rack travel in: 11.60  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1375...1405  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 6...14

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.10  
Speed rpm : 275  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION  
Speed rpm : 275...375

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 12.60...12.70

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.50...11.60  
2nd pressure hPa : 190  
Rack travel in m: 12.20...12.30  
3rd pressure hPa : 170  
Rack travel in m: 11.70...11.90

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 76.0...78.0  
1000 s: (73.0...81.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: -1.00  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : -7.00...-7.20  
Del.quantity cm<sup>3</sup>/ : 11.0...17.0  
1000 s: (8.0...20.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

#### APPLICATION

Omnibus

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : VOL 7,1 a 1  
 Edition : 10.02.89  
 Replaces : 12.9.86  
 Test oil : ISO-4113

Combination no. : 0 401 846 506

Injection pump  
 Pump designation : PE6P110A32ORS483-1  
 EP type number : 0 411 816 160  
 Governor  
 Governor design. : RQV250...1200PA499-2  
 Governor no. : 0 421 813 461

Customer-spec. information  
 Customer : VOLVO

Engine : TD71FS

1st version kw : 180.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700

Rack travel in mm : 13.10...13.20

Del.quantity cm<sup>3</sup>/ : 14.2...14.4

100 s: (13.9...14.7)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (-)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250  
 travel mm : 1.20...1.30

2nd speed rpm : 300  
 travel mm : 1.70...2.00

3rd speed rpm : 400  
 travel mm : 2.50...2.80

4th speed rpm : 700  
 travel mm : 4.40...4.70

5th speed rpm : 1200  
 travel mm : 7.60...7.80

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1300

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 142.0...144.0

1000 : (139.0...147.0)



Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 58...66

Testing:  
1st rack travel in: 12.10  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1385...1415  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 5...13

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.80  
Speed rpm : 250  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION  
Speed rpm : 300...410

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.10...13.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.20...10.30  
2nd pressure hPa : 700  
Rack travel in m: 12.90...13.00  
3rd pressure hPa : 300  
Rack travel in m: 10.60...10.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 134.0...138.0  
1000 s: (131.0...141.0)  
Aneroid pressure h: -  
Speed rpm : 700

Del.quantity cm<sup>3</sup>/ : 85.0...88.0  
1000 s: (82.0...91.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.10  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...200.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
Spread cm<sup>3</sup> : 3.00  
1000 s: (6.00)

#### Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : ENA 10,1 b  
Edition : 07.02.89  
Replaces : 25.3.88  
Test oil : ISO-4113  
  
Combination no. : 0 401 846 546  
  
Injection pump  
Pump designation : PE6P100A820LS130  
EP type number : 0 411 806 179  
Governor  
Governor design. : RQV250...1050PA807-1  
Governor no. : 0 421 813 665

Customer-spec. information  
Customer : ENASA

Engine : 95 A1 BX

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
                  : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 11.70...11.80

Del.quantity cm<sup>3</sup>/ : 11.4...11.6

100 s: (11.2...11.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 7.9...8.1

Del.quantity cm<sup>3</sup>/ : 1.8...2.2

100 s: (1.5...2.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 0.90...1.30

2nd speed rpm : 350  
travel mm : 1.60...2.20

3rd speed rpm : 700  
travel mm : 4.40...5.00

4th speed rpm : 1095  
travel mm : 7.90...8.10

5th speed rpm : 1185  
travel mm : 8.80...9.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1120

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Del.quantity : 114.0...116.0

1000 : (112.0...118.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 41...49

Testing:  
1st rack travel in: 10.70  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 12...20

Testing:  
Speed rpm : 100  
Minimum rack trave: 7.50  
Speed rpm : 250  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 250...400

#### START CUT-OUT

Speed 1/min : 170 (150)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.70  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 260.0...280.0  
1000 s: (256.0...284.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.90...6.10

Remarks:

:

#### APPLICATION

Special-purpose vehicle

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : ENA 11,9 a1  
 Edition : 24.02.89  
 Replaces : 19.5.88  
 Test oil : ISO-4113

Combination no. : 0 401 846 550

Injection pump  
 Pump designation : PE6P120A320RS257  
 EP type number : 0 411 826 075  
 Governor  
 Governor design. : RQV250...1050PA808  
 Governor no. : 0 421 813 553

Customer-spec. information  
 Customer : ENASA

Engine : 96 T1 CX

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1030

---

Rack travel in mm : 10.90...11.00

---

Del.quantity cm3/ : 20.9...21.1

---

100 s: (20.6...21.4)

---

Spread cm3 : 0.5

---

100 s: (0.9)

---

2nd speed rpm : 250.0

Rack travel in mm : 5.6...5.8

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

**(B) Setting of injection pump  
 with governor**

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250  
 travel mm : 1.00...1.40

2nd speed rpm : 350  
 travel mm : 1.70...2.30

3rd speed rpm : 700  
 travel mm : 4.50...5.10

4th speed rpm : 1095  
 travel mm : 8.20...8.40

5th speed rpm : 1175  
 travel mm : 9.10...9.50

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1090

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1030

Aneroid pressure h: 900

Del.quantity : 209.0...211.0

1000 : (206.0...214.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 48...56

Testing:  
1st rack travel in: 9.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 13...21

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.20  
Speed rpm : 250  
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION  
Speed rpm : 250...370

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 10.90...11.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.30...8.70  
2nd pressure hPa : 510  
Rack travel in m: 10.40...10.50  
3rd pressure hPa : 300  
Rack travel in m: 9.20...9.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 187.0...193.0  
1000 s: (184.0...196.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 119.0...121.0  
1000 s: (116.0...124.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)  
Rack travel in mm : 19.50...21.00

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

#### APPLICATION

Special-purpose vehicle

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : SCA 11,0 y  
 Edition : 21.05.87  
 Replaces : 9.3.87  
 Test oil : ISO-4113

Combination no. : 0 401 846 764

Injection pump  
 Pump designation : PE6P110A72DRS3115  
 EP type number : 0 411 816 735  
 Governor  
 Governor design. : RQV200...1100PA468  
 Governor no. : 0 421 813 364

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DN11 01

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 3.30...3.40  
 : (3.25...3.45)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 600

Rack travel in mm : 12.40...12.50

Del. quantity cm<sup>3</sup>/ : 11.9...12.1

100 s: (11.7...12.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.7)

2nd speed rpm : 225.0

Rack travel in mm : 5.4...5.6

Del. quantity cm<sup>3</sup>/ : 2.0...2.4

100 s: (-)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 225  
 travel mm : 0.90...1.00

2nd speed rpm : 360  
 travel mm : 2.60...2.90

3rd speed rpm : 560  
 travel mm : 4.30...4.60

4th speed rpm : 1150  
 travel mm : 8.40...8.60

5th speed rpm : 1250  
 travel mm : 9.50...9.80

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 600

Del. quantity : 119.0...121.0

1000 : (117.0...123.0)

Spread cm<sup>3</sup> : 5.00

1000 : (7.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 57...65

Testing:  
1st rack travel in: 11.40  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1250...1280  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 6...14

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.90  
Speed rpm : 225  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 330...390

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1100  
Del. quantity cm<sup>3</sup>/ : 119.5...124.5  
1000 s: (118.0...126.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.40  
Speed rpm : 1140...1150

INTERMEDIATE RATED SPEED  
Rack travel in mm : 4.00

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 5.40...5.60  
Del. quantity cm<sup>3</sup>/ : 20.0...24.0  
Spread cm<sup>3</sup> : 2.00  
1000 s: (4.00)

#### Remarks:

:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

#### ADDITIONAL INFORMATION

Check and set without ROBO diaphragam

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on April 10, 1984

Start of delivery - engine: 21° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : PER 12,2 c  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 797  
 Injection pump  
 Pump designation : PES6P120A320RS3212  
 EP type number : 0 412 026 731  
 Governor  
 Governor design. : RQV250..1050PA794-2  
 Governor no. : 0 421 813 698

Customer-spec. information  
 Customer : PERKINS

Engine : EAGLE TX

1st version kW : 240.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 900

Rack travel in mm : 14.60...14.70

Del.quantity cm3/ : 23.9...24.1

100 s: (23.6...24.4)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...2.0)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250  
 travel mm : 0.90...1.30

2nd speed rpm : 350  
 travel mm : 2.90...3.50

3rd speed rpm : 700  
 travel mm : 4.00...4.60

4th speed rpm : 1000  
 travel mm : 7.40...7.60

5th speed rpm : 1100  
 travel mm : 8.80...9.20

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1070

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 900

Aneroid pressure h: 1200



Del.quantity : 239.0...241.0  
1000 : (236.0...244.0)  
Spread cm3 : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 50...58

Testing:  
1st rack travel in: 13.60  
Speed rpm : 980...990  
2nd rack travel in: 4.00  
Speed rpm : 1085...1115  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 16...24

Testing:  
Speed rpm : 100  
Minimum rack trave: 7.50  
Speed rpm : 250  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 250...550

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 14.60...14.70

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.20...12.30  
2nd pressure hPa : 900  
Rack travel in m: 14.10...14.20  
3rd pressure hPa : 510  
Rack travel in m: 12.60...12.80

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 243.0...249.0  
1000 s: (240.0...252.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.60  
Speed rpm : 980...990

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...170.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.90...6.10

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : UNI 9,5 a 2  
 Edition : 07.02.89  
 Replaces : 30.9.88  
 Test oil : ISO-4113

Combination no. : 0 402 046 800

Injection pump  
 Pump designation : PES6P110A72ORS3140  
 EP type number : 0 412 016 716  
 Governor  
 Governor design. : RQV275...1100PA501-6  
 Governor no. : 0 421 813 711

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8460.21.202/206

1st version kW : 176.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1100

Rack travel in mm : 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 13.9...14.2

100 s : (13.6...14.4)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 275.0  
 Rack travel in mm : 6.8...7.0  
 Del.quantity cm<sup>3</sup>/ : 2.2...2.7  
 100 s : (1.9...2.9)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250  
 travel mm : 1.00...1.20  
 2nd speed rpm : 400  
 travel mm : 2.70...3.00  
 3rd speed rpm : 850  
 travel mm : 5.00...5.20  
 4th speed rpm : 1100  
 travel mm : 6.80...7.00  
 5th speed rpm : 1500  
 travel mm : 11.00...12.00

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1260  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 700  
 Del.quantity : 139.0...142.0  
 1000 : (136.5...144.5)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

RATED SPEED

1st version  
Control Lever  
position degrees: 59...67

Testing:  
1st rack travel in: 10.30  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1245...1275  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 11...19

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.40  
Speed rpm : 275  
Rack travel in mm : 6.80...7.00

CONSTANT REGULATION  
Speed rpm : 280...525

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.30...11.40

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 280  
Rack travel in m: 10.80...10.90  
3rd pressure hPa : 260  
Rack travel in m: 10.30...10.50

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 104.0...107.0  
1000 s: (101.5...109.5)

BREAKAWAY

1st version

G20

1mm rack travel less than  
full load rack tr: 10.30  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...170.0  
1000 s: (136.0...174.0)

Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,7 a12  
 Edition : 04.11.88  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 802  
 Injection pump  
 Pump designation : PES6P110A820LS3131-1  
 EP type number : 0 412 016 717  
 Governor  
 Governor design. : RQ300/1100PA722-2  
 Governor no. : 0 421 801 459

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM447

1st version kW : 177.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
 : (4.25...4.45)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.00...11.10

Del.quantity cm3/ : 13.9...14.1

100 s: (13.6...14.3)

Spread cm3 : 0.4

100 s: (0.8)

2nd speed rpm : 300.0

Rack travel in mm : 7.2...7.4

Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.4

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 13.00...14.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 139.0...141.0

1000 : (136.5...143.5)

Spread cm3 : 4.00

1000 : (8.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 13.5

Testing:

1st rack travel in: 10.00

Speed rpm : 1140...1150

2nd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.3

Testing:

Speed rpm : 100  
Minimum rack trave: 8.80  
Speed rpm : 300  
Rack travel in mm : 7.20...7.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm3/ : 116.0...119.0  
1000 s: (113.0...122.0)  
Spread cm3 : 5.00  
1000 s: (9.00)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 10.00  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (126.0...154.0)

Remarks:

:

Adjust full-load delivery by turning  
temperature-dependent excess-fuel stop  
for starting (TAS).

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : RVI 14,9 f1  
 Edition : 07.02.89  
 Replaces : 10.4.87  
 Test oil : ISO-4113

Combination no. : 0 402 048 046

Injection pump  
 Pump designation : PES8P120A320RS507  
 EP type number : 0 412 028 023  
 Governor  
 Governor design. : RQV275...1050PA665-2  
 Govenor no. : 0 421 813 623

Customer-spec. information  
 Customer : RVI

Engine : MIVR083530

1st version kW : 268.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 8- 4- 2- 7- 3-  
 6- 5

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1050

---

Rack travel in mm : 11.00...11.10

---

Del.quantity cm3/ : 18.2...18.4  
 100 s: (17.9...18.7)

---

Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 275.0  
 Rack travel in mm : 5.2...5.4  
 Del.quantity cm3/ : 1.9...2.5  
 100 s: (1.6...2.8)

Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 275  
 travel mm : 0.60...1.00

2nd speed rpm : 450  
 travel mm : 3.20...3.60

3rd speed rpm : 550  
 travel mm : 4.10...4.50

4th speed rpm : 700  
 travel mm : 5.00...5.40

5th speed rpm : 1050  
 travel mm : 7.50...7.70

GUIDE SLEEVE POSITION  
 Control-lever position  
 Degree: -1

Speed rpm : 1130  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 700

Del.quantity : 182.0...184.0  
1000 : (179.0...187.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 49...57

Testing:  
1st rack travel in: 10.00  
Speed rpm : 1105...1115  
2nd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 16...24

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.40  
Speed rpm : 275  
Rack travel in mm : 5.60...5.80

#### CONSTANT REGULATION

Speed rpm : 300...430

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.00...11.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 150  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 110  
Rack travel in m: 9.80...10.00

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

1st version

G24

Aneroid pressure h: 700  
Speed rpm : 650  
Del.quantity cm3/ : 165.0...171.0  
1000 s: (162.0...174.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 116.0...118.0  
1000 s: (113.0...121.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: -1.00  
Speed rpm : 1105...1115

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...160.0  
1000 s: (136.0...164.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : -5.20...-5.40  
Del.quantity cm3/ : 19.0...25.0  
1000 s: (16.0...28.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

:  
Start-of-delivery mark 13° cam angle  
after start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC 9,4 a 4  
 Edition : 7.2.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 058 043

Injection pump  
 Pump designation : PES8P100A921/5RS286  
 Governor  
 Governor design. : RQV300...1300PA443KR

Customer-spec. information  
 Customer : IHC

Engine : DVT 800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45

Overflow valve : 1 417 413 040

Inlet press., bar : 2.70

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 9 681 230 713

Outside diameter  
 x Wall thickness  
 x Length mm : 1/4"X0.083"X40"

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)  
 Rack travel in mm : 10.50  
 Firing order : 1-8-4-2-7-3-6-5

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.20...12.30

Del. quantity cm<sup>3</sup>/ : 13.8...14.0

100 s : (-)

Spread cm<sup>3</sup> : 0.4

100 s : (-)

2nd speed rpm : 300  
 Rack travel in mm : 5.00  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.0

100 s : (-)

Spread cm<sup>3</sup> : 0.5

100 s : (-)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1320

Rack travel in mm : 15.00...17.50

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1300

Aneroid pressure h: 800

Del. quantity : 138.0...140.0

1000 : (-)

Spread cm<sup>3</sup> : 4.0

1000 : (-)

## RATED SPEED

### 1st version

Control lever

position degrees: 60.5...65.5

### Testing:

1st rack travel in: 11.20

Speed rpm : 1340...1350

2nd rack travel in: 4.00

Speed rpm : 1450...1480

4th rack travel in: 1640

Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever



position degrees: 8.5...13.5

Testing:

Speed rpm : 100  
Minimum rack travel: 6.20  
Speed rpm : 300  
Rack travel in mm : 5.00...5.20  
Rack travel in mm : 2.00  
Speed rpm : 425...485

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 12.15...12.25  
2nd speed rpm : 900  
Rack travel in m: 11.70...11.80  
3rd speed rpm : 700  
Rack travel in m: 11.20...11.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 800  
Pressure hPa : 160  
Rack travel mm : +0.50

Measurement

Speed 1/min : 800

1st pressure hPa : 620  
Rack travel in m: 11.60...11.80

START CUT-OUT

Speed 1/min : 170...230

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 132.0...138.0  
1000 s: (-)  
Spread cm<sup>3</sup> : -  
1000 s: (-)  
Aneroid pressure h: -  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 89.0...97.0  
1000 s: (-)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 188.0...228.0  
1000 s: (-)

LOW IDLE

Speed rpm : 300  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (-)

Remarks:

Start-of-delivery mark is at start of  
delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 10,0 n
Edition : 07.02.89
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 075 700
Injection pump
Pump designation : PES5P110A720LS3221
EP type number : 0 412 015 701
Governor
Governor design. : RSV350...1100POA487-7
Governor no. : 0 421 833 314

Customer-spec. information
Customer : DAIMLER-BENZ

Engine : OM449

1st version kW : 140.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 100...120

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40
: (4.25...4.45)
Rack travel in mm : 9.00...12.00
Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

BASIC SETTING

1st speed rpm : 1080

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 13.5...13.7

100 s: (13.2...13.9)

Spread cm3 : 0.4

100 s: (0.8)

2nd speed rpm : 350.0
Rack travel in mm : 6.3...6.7
Del.quantity cm3/ : 1.2...1.8
100 s: (0.9...2.0)

Spread cm3 : 0.4
100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1080

Del.quantity : 135.0...137.0

1000 : (132.5...139.5)

Spread cm3 : 4.00

1000 : (8.00)

RATED SPEED

1st version

Control lever

position degrees: 40...48

Testing:

1st rack travel in: 9.80

Speed rpm : 1130...1140

2nd rack travel in: 4.00

Speed rpm : 1190...1220  
4th rack travel in: 1250  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.5  
Speed rpm : 350  
Rack travel in mm : 6.30...6.70  
Rack travel in mm : 2.00  
Speed rpm : 470...530

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 114.0...118.0  
1000 s: (111.0...121.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1130...1140

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,6 L 2  
Edition : 8.2.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 076 028  
Injection pump  
Pump designation : PES6P110A72ORS305  
Governor  
Governor design. : RSV400...1050P2/415D  
R

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6466 A

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 457 413 010  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 0 681 343 009  
Opening  
pressure, bar : 172...175  
Test lines : 1 680 750 015  
Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Prestroke mm : 2.75...2.85  
                  : (2.70...2.90)  
Rack travel in mm : 11.70  
Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300  
Tolerance + - ° : 0.5 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050  
Rack travel in mm : 11.70...11.80

Del. quantity cm<sup>3</sup>/ : 16.0...16.2  
100 s : (15.8...16.4)

Spread cm<sup>3</sup> : 0.4  
100 s : (-)

2nd speed rpm : 400  
Rack travel in mm : 6.20...6.40  
Del. quantity cm<sup>3</sup>/ : 1.9...2.5  
100 s : (-)  
Spread cm<sup>3</sup> : 0.4  
100 s : (-)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: 800  
Speed rpm : -3  
Rack travel in mm : 0.40...1.70

Governor spring pre-tension  
Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050  
Aneroid pressure h: 800  
Del. quantity : 160.0...162.0  
1000 : (158.0...164.0)  
Spread cm<sup>3</sup> : 4.0  
1000 : (-)

## RATED SPEED

1st version  
Control lever  
position degrees: 40...48

Testing:  
1st rack travel in: 10.70  
Speed rpm : 1095...1105  
2nd rack travel in: 6.00  
Speed rpm : 1130...1170

## LOW IDLE 1

Control lever  
position degrees: 17...25

Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 6.00...6.20

Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 6.00...6.20  
Rack travel in mm : 2.00  
Speed rpm : 570...630

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 11.70...11.80  
2nd speed rpm : 730  
Rack travel in m: 11.70...11.80  
3rd speed rpm : 650  
Rack travel in m: 12.20...12.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 550  
Pressure hPa : 800  
Rack travel mm : 11.70...11.80

Measurement

Speed 1/min : 550

1st pressure hPa : 175 \*

START CUT-OUT

Speed 1/min : 350...450

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800  
Speed rpm : 650  
Del.quantity cm3/ : 170.0...174.0  
1000 s: (168.0...176.0)

Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 88.0...96.0  
1000 s: (86.0...98.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.70

H02

Speed rpm : 1095...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0  
1000 s: (-)

HIGH IDLE

1st version

Speed rpm : 1150  
Del.quantity cm3/ : 47.0...57.0  
1000 s: (-)

LOW IDLE

Speed rpm : 400  
Del.quantity cm3/ : 19.0...25.0  
1000 s: (-)

Remarks:

\* Start of LDA (manifold-pressure  
compensator) movement

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,6 y 1  
Edition : 20.12.88  
Replaces : 30.9.88  
Test oil : ISO-4113

Combination no. : 0 402 076 722

Injection pump  
Pump designation : PES6P120A720RS3203  
EP type number : 0 412 026 728  
Governor  
Governor design. : RSV400...1100P2A534  
Governor no. : 0 421 833 275

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6466 HF-050

1st version kW : 194.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65  
                  : (3.50...3.70)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 15.6...15.8

100 s: (15.4...16.1)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 400.0  
Rack travel in mm : 4.8...5.0  
Del.quantity cm<sup>3</sup>/ : 1.7...2.2

100 s: (1.5...2.5)

Spread cm<sup>3</sup> : 0.4  
100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 156.5...158.5

1000 : (154.0...161.0)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 40...48

Testing:

1st rack travel in: 11.00  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1200...1210  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.4

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Rack travel in mm : 2.00  
Speed rpm : 540...600

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 750  
Rack travel in m: 12.80...13.00

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.30...10.50

#### Measurement

Speed 1/min : 500  
1st pressure hPa : 605  
Rack travel in m: 11.00...11.10  
2nd pressure hPa : 780  
Rack travel in m: 12.10...12.50  
3rd pressure hPa : 1200  
Rack travel in m: 12.80...13.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 174.5...179.5  
1000 s: (172.0...182.0)  
Aneroid pressure h: -  
Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 117.5...121.5  
1000 s: (114.5...124.5)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Del.quantity cm<sup>3</sup>/ : 17.5...22.5  
1000 s: (15.0...25.0)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

#### Remarks:

: JOHN DEERE # RE32035  
Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : DEE 7,6 y  
 Edition : 20.12.88  
 Replaces : 30.9.88  
 Test oil : ISO-4113

Combination no. : 0 402 076 723

Injection pump  
 Pump designation : PES6P120A72ORS3203  
 EP type number : 0 412 026 728  
 Governor  
 Governor design. : RSV400...1100P2A534-  
 1  
 Governor no. : 0 421 833 276

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6466 AF-050

1st version kW : 180.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65  
 : (3.50...3.70)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1100

---

Rack travel in mm : 11.80...11.90

---

Del.quantity cm<sup>3</sup>/ : 15.0...15.2  
 100 s: (14.7...15.4)

---

Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

2nd speed rpm : 400.0  
 Rack travel in mm : 4.8...5.0  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.2  
 100 s: (1.5...2.5)  
 Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : ?

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 1200  
 Del.quantity : 150.0...152.0  
 1000 : (147.5...154.5)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 40...48



Testing:

1st rack travel in: 10.80  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1200...1210  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.4

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Rack travel in mm : 2.00  
Speed rpm : 540...600

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.80...11.90  
2nd speed rpm : 700  
Rack travel in m: 12.60...12.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 12.60...12.80

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.40...10.60  
2nd pressure hPa : 720  
Rack travel in m: 11.00...11.10  
3rd pressure hPa : 895  
Rack travel in m: 11.80...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 173.5...178.5  
1000 s: (171.0...181.0)  
Aneroid pressure h: -  
Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 120.0...124.0  
1000 s: (117.0...127.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.80  
Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Del.quantity cm<sup>3</sup>/ : 17.5...22.5  
1000 s: (15.0...25.0)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:

: JOHN DEERE # RE32033

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,7 d 2  
 Edition : 07.02.89  
 Replaces : 7.3.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 076 725  
 Injection pump  
 Pump designation : PES6P110A820LS3131-1  
 EP type number : 0 412 016 717  
 Governor  
 Governor design. : RSV350..1050POA487-5  
 Governor no. : 0 421 833 285

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM447

1st version kW : 177.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

H07

Prestroke mm : 4.30...4.40  
 : (4.25...4.45)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 12.50...12.60

Del.quantity cm<sup>3</sup>/ : 15.0...15.2

100 s: (14.7...15.4)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

2nd speed rpm : 350.0

Rack travel in mm : 7.0...7.3

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Del.quantity : 150.0...152.0

1000 : (147.5...154.5)

Spread cm<sup>3</sup> : 4.00

1000 : (8.00)

RATED SPEED

1st version

Control lever

position degrees: 43...51

Testing:

1st rack travel in: 11.50

Speed rpm : 1075...1085  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1350  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 20...28  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 7.1

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 350  
Rack travel in mm : 7.00...7.30  
Rack travel in mm : 2.00  
Speed rpm : 400...440

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 600  
Del.quantity cm3/ : 133.0...137.0  
1000 s: (130.0...140.0)  
Spread cm3 : 6.00  
1000 s: (9.00)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1075...1085

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (126.0...154.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.00...7.30  
Del.quantity cm3/ : 14.0...20.0  
1000 s: (11.0...23.0)  
Spread cm3 : 4.50  
1000 s: (7.00)

Remarks:

H08

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,7 b  
 Edition : 20.12.88  
 Replaces : 30.9.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 076 727  
 Injection pump  
 Pump designation : PES6P120A72ORS3203  
 EP type number : 0 412 026 728  
 Governor  
 Governor design. : RSV400...1100P2A534-  
 2  
 Govenor no. : 0 421 833 290

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6076AF

1st version kW : 160.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

H09

Prestroke mm : 3.55...3.65  
 : (3.50...3.70)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.10...11.20

Del.quantity cm<sup>3</sup>/ : 13.4...13.6

100 s: (13.1...13.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 400.0

Rack travel in mm : 4.8...5.0

Del.quantity cm<sup>3</sup>/ : 1.7...2.2

100 s: (1.5...2.5)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 134.0...136.0

1000 : (131.5...138.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 40...48

Testing:

1st rack travel in: 10.10

Speed rpm : 1145...1155

2nd rack travel in: 4.00  
Speed rpm : 1200...1210  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control Lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.4

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Rack travel in mm : 2.00  
Speed rpm : 540...600

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 700  
Rack travel in m: 12.40...12.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.50...10.70

Measurement  
Speed 1/min : 500

1st pressure hPa : 470  
Rack travel in m: 11.20...11.30  
2nd pressure hPa : 605  
Rack travel in m: 11.80...12.20  
3rd pressure hPa : 900  
Rack travel in m: 12.40...12.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 165.5...170.5  
1000 s: (163.0...173.0)  
Aneroid pressure h: -  
Speed rpm : 800  
Del.quantity cm3/ : 122.0...126.0  
1000 s: (121.0...131.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Del.quantity cm3/ : 17.5...22.5  
1000 s: (15.0...25.0)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks: : JOHN DEERE # RE32034

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : DEE 7,7 c  
 Edition : 20.12.88  
 Replaces : 30.9.88  
 Test oil : ISO-4113

Combination no. : 0 402 076 728

Injection pump  
 Pump designation : PES6P120A72ORS3203  
 EP type number : 0 412 026 728  
 Governor  
 Governor design. : RSV425...1050P2A489-  
 2  
 Governor no. : 0 421 833 291

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6076 HRW01

1st version kW : 175.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65  
 : (3.50...3.70)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1050

---

Rack travel in mm : 12.20...12.30

---

Del.quantity cm3/ : 16.0...16.2  
 100 s: (15.7...16.4)

---

Spread cm3 : 0.4  
 100 s: (0.7)

2nd speed rpm : 425.0  
 Rack travel in mm : 4.8...5.0  
 Del.quantity cm3/ : 1.7...2.2  
 100 s: (1.5...2.5)

Spread cm3 : 0.4  
 100 s: (0.7)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.75

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 1200  
 Del.quantity : 160.0...162.0  
 1000 : (157.5...164.5)

Spread cm3 : 4.00  
 1000 : (7.50)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 40...48

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1170  
4th rack travel in: 1250  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 425  
Rack travel in mm : 4.4

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 425  
Rack travel in mm : 4.80...5.00  
Rack travel in mm : 2.00  
Speed rpm : 570...630

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 600  
Rack travel in m: 13.40...13.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.10...12.30  
2nd pressure hPa : 725  
Rack travel in m: 12.50...12.60  
3rd pressure hPa : 815  
Rack travel in m: 12.90...13.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 191.0...196.0  
1000 s: (188.5...198.5)  
Aneroid pressure h: -  
Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 157.0...161.0  
1000 s: (154.0...164.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 425  
Rack travel in mm : 4.80...5.00  
Del.quantity cm<sup>3</sup>/ : 17.5...22.5  
1000 s: (15.0...25.0)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks: : JOHN DEERE # RE32888

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 10,1 g1  
Edition : 20.12.88  
Replaces : 30.9.88  
Test oil : ISO-4113  
Combination no. : 0 402 076 731  
Injection pump  
Pump designation : PES6P110A72ORS3217  
EP type number : 0 412 016 724  
Governor  
Governor design. : RSV400...1050P2A534-  
4  
Governor no. : 0 421 833 305

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6101 H

1st version kW : 224.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness : 6.00X3.00X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.45...3.55  
: (3.40...3.60)

Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.90...13.00

Del. quantity cm<sup>3</sup>/ : 21.2...21.4

100 s: (20.9...21.6)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 400.0  
Rack travel in mm : 5.2...5.4  
Del. quantity cm<sup>3</sup>/ : 2.0...2.5

100 s: (1.8...2.8)

Spread cm<sup>3</sup> : 0.4  
100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3

Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050  
Aneroid pressure h: 1200  
Del. quantity : 212.0...214.0  
1000 : (209.5...216.5)  
Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 36...44

Testing:  
1st rack travel in: 11.90  
Speed rpm : 1090...1100



2nd rack travel in: 4.00  
Speed rpm : 1145...1155  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 14...22  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.8

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 2.00  
Speed rpm : 560...620

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 700  
Rack travel in m: 13.70...13.90

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.70...13.90

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.90...11.10  
2nd pressure hPa : 325  
Rack travel in m: 11.60...11.70  
3rd pressure hPa : 640  
Rack travel in m: 12.90...13.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 228.0...233.0  
1000 s: (225.5...235.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 160.0...164.0  
1000 s: (157.0...167.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 165.0...185.0  
1000 s: (160.0...190.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.20...5.40  
Del.quantity cm<sup>3</sup>/ : 20.5...25.5  
1000 s: (18.0...28.0)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

#### Remarks:

: JOHN DEERE # RE36881

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,7 d 3  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 076 732  
Injection pump  
Pump designation : PES6P110A820LS3131-1  
EP type number : 0 412 016 717  
Governor  
Governor design. : RSV350..1100POA487-6  
Governor no. : 0 421 833 311

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM447

1st version kW : 177.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
                  : (4.25...4.45)  
Rack travel in mm : 9.00...12.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1080

Rack travel in mm : 11.70...11.80

Del. quantity cm<sup>3</sup>/ : 14.4...14.6

100 s: (14.1...14.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

2nd speed rpm : 350.0  
Rack travel in mm : 7.0...7.3  
Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
100 s: (1.1...2.3)  
Spread cm<sup>3</sup> : 0.4  
100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1080

Del. quantity : 144.0...146.0

1000 : (141.5...148.5)

Spread cm<sup>3</sup> : 4.00

1000 : (8.00)

## RATED SPEED

1st version

Control lever

position degrees: 43...51

Testing:

1st rack travel in: 10.70

Speed rpm : 1130...1140  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1350  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 20...28  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 7.1

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 350  
Rack travel in mm : 7.00...7.30  
Rack travel in mm : 2.00  
Speed rpm : 400...440

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 600  
Del.quantity cm3/ : 124.0...128.0  
1000 s: (121.0...131.0)  
Spread cm3 : 6.00  
1000 s: (9.00)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.70  
Speed rpm : 1130...1140

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (126.0...154.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.00...7.30  
Del.quantity cm3/ : 14.0...20.0  
1000 s: (11.0...23.0)  
Spread cm3 : 4.50  
1000 s: (7.00)

Remarks:

H16

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MTU 26,5 b2  
Edition : 9.2.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 438 028  
Injection pump  
Pump designation : PE8ZW160/120RS1027  
/11  
EP type number : 0 402 468 006  
Governor  
Governor design. : RQUV300...900ZWA67  
Governor no. : 0 422 409 037

## Customer-spec. information

Customer : MTU

Engine : 8V 331

1st version kW : 452.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 40...45

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 443 022

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 016

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.00X1500

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Prestroke mm : 2.50...2.60  
: (2.45...2.65)  
Rack travel in mm : 18.00

H17

Firing order : 8-1-2-6-3-4-5-7

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 10.00

Del.quantity cm<sup>3</sup>/ : 23.0...24.0

100 s : (22.7...24.3)

Spread cm<sup>3</sup> : 1.2

100 s : (1.8)

2nd speed rpm : 600

Rack travel in mm : 10.00

Del.quantity cm<sup>3</sup>/ : 19.0...21.0

100 s : (18.5...21.5)

Spread cm<sup>3</sup> : 1.5

100 s : (2.2)

3rd speed rpm : 300

Rack travel in mm : 9.00

Del.quantity cm<sup>3</sup>/ : 7.2...9.2

100 s : (6.7...9.7)

Spread cm<sup>3</sup> : 1.0

100 s : (1.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 900

Rack travel in mm : 18.00...18.10

## RATED SPEED

1st version

Control lever

position degrees: 75...83

Testing:

1st rack travel in: 17.00

Speed rpm : 905...925

2nd rack travel in: 4.00

Speed rpm : 1000...1050

4th rack travel in: 1100

Speed rpm : 0.00...2.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 300

Rack travel in mm : 8.00

Control lever  
position degrees: 18...24

LOW IDLE 1  
Control lever  
position degrees: 18...24

Testing:  
Speed rpm : 200  
Minimum rack trave: 10.80  
Speed rpm : 400  
Rack travel in mm : 3.90...5.00  
Rack travel in mm : <0.01  
Speed rpm : 485...590

LOW IDLE 2  
Control lever  
position degrees: 24...30  
Setting point w/out bumper spring  
Speed rpm : 375  
Rack travel in mm : 8.00

Testing:  
Speed rpm : 200  
Rack travel in mm : 14.3...17.2  
Speed rpm : 300  
Rack travel in mm : 10.3...11.8  
Speed rpm : 500  
Rack travel in mm : 1.9...3.7

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 17.00  
Speed rpm : 905...925

#### Remarks:

Full-load delivery is set on engine  
according to engine test report.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER 16,3 a  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 638 804  
Injection pump  
Pump designation : PE8P120A12ORS7167  
EP type number : 0 412 628 834  
Governor  
Governor design. : RQV300...1050PA908  
Governor no. : 0 421 813 734

Customer-spec. information  
Customer : PERKINS

Engine : CV8  
1st version kW : 485.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 1 688 901 019  
Opening  
pressure, bar : 207...210  
Orifice plate  
diameter mm : 0,8  
Test Lines : 1 680 750 067  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
                  : (4.45...4.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 6- 5- 4- 8-  
                  7- 2

Phasing : 0-45-90-135-180-225-  
                  270-315  
Tolerance + - ° : 0.50 (0.75)  
Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900  
Rack travel in mm : 13.10...13.20  
Del.quantity cm<sup>3</sup>/ : 31.0...31.2  
                  100 s: (30.6...31.6)  
Spread cm<sup>3</sup> : 0.5  
                  100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 5.0...5.4  
Del.quantity cm<sup>3</sup>/ : 2.2...2.8  
                  100 s: (1.9...3.1)  
Spread cm<sup>3</sup> : 0.8  
                  100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
          travel mm : 1.10...1.50  
2nd speed rpm : 500  
          travel mm : 3.40...3.80  
3rd speed rpm : 800  
          travel mm : 5.10...5.50  
4th speed rpm : 1060  
          travel mm : 7.70...7.90  
5th speed rpm : 1185  
          travel mm : 9.10...9.50

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1100  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 900

Aneroid pressure h: 1200  
Del. quantity : 310.0...312.0  
1000 : (306.0...316.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 51...59

Testing:  
1st rack travel in: 12.10  
Speed rpm : 1055...1065  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 18...26

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.70  
Speed rpm : 300  
Rack travel in mm : 5.00...5.40

CONSTANT REGULATION  
Speed rpm : 300...500

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.10...13.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 850  
Rack travel in m: 12.60...12.70  
3rd pressure hPa : 700  
Rack travel in m: 11.70...11.90

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600

Del. quantity cm<sup>3</sup>/ : 317.0...323.0  
1000 s: (314.0...326.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 238.0...242.0  
1000 s: (236.0...244.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.10  
Speed rpm : 1055...1065

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 20.00...21.00

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### APPLICATION

Navy

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 21,0 a  
Edition : 10.2.89  
Replaces : 1.7.88  
Test oil : ISO-4113

Combination no. : 0 402 640 811

Injection pump  
Pump designation : PE12P120A520LS7812  
EP type number : 0 412 620 807  
Governor  
Governor design. : RQV250...1150PA860-1  
Governor no. : 0 421 813 692

Customer-spec. information  
Customer : MAN

Engine : D2842LYE

1st version kW : 735.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.90...5.00  
                  : (4.85...5.05)  
Rack travel in mm : 9.00...12.00  
Firing order : 12- 1- 5- 9- 8- 3  
                  - 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
                  180-225-240-285-300-  
Phasing : 345  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 1150

---

Rack travel in mm : 13.20...13.30

---

Del.quantity cm3/ : 28.9...29.1  
100 s: (28.6...29.4)

---

Spread cm3 : 0.5  
100 s: (0.9)

---

2nd speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Del.quantity cm3/ : 5.2...6.0 \*  
100 s: (-)

3rd speed rpm : 500  
Rack travel in mm : < 7.50  
Del.quantity cm3/ : - \*\*  
100 s: (-)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 2.00...2.40  
2nd speed rpm : 900  
travel mm : 6.70...7.10  
3rd speed rpm : 1150  
travel mm : 8.50...8.60

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1150  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1150  
Aneroid pressure h: 1300



Del.quantity : 289.0...291.0  
1000 : (286.0...294.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 63...71

Testing:  
1st rack travel in: 12.20  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1345...1375  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8..16

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.90  
Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 405...465

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 13.20...13.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.80...9.00  
2nd pressure hPa : 270  
Rack travel in m: 9.20...9.30  
3rd pressure hPa : 790  
Rack travel in m: 11.40...11.80

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -

H22

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 146.0...148.0  
1000 s: (143.0...151.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.20  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0 \*  
1000 s: (-)

#### LOW IDLE

Speed rpm : 500  
Rack travel in mm : <8.00  
Del.quantity cm<sup>3</sup>/ : <50.0  
1000 s: (-)

Remarks:

:

\* applies to cylinders 4, 5, 6, 8, 10  
and 12

\*\* applies for cylinders 1, 2, 3, 7, 9  
and 11

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 21,0 a1  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 640 813  
Injection pump  
Pump designation : PE12P120A520LS7812  
EP type number : 0 412 620 807  
Governor  
Governor design. : RQV250...1150PA902-1  
Governor no. : 0 421 813 728

Customer-spec. information  
Customer : MAN

Engine : D2842LYE

1st version kW : 735.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.90...5.00  
                  : (4.85...5.05)  
Rack travel in mm : 9.00...12.00  
Firing order : 12- 1- 5- 9- 8- 3-  
                  : 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
                  : 180-225-240-285-300-  
Phasing : 345  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 1150  
Rack travel in mm : 13.20...13.30  
Del. quantity cm<sup>3</sup>/ : 28.9...29.1  
100 s : (28.6...29.4)  
Spread cm<sup>3</sup> : 0.5  
100 s : (0.9)

2nd speed rpm : 250.0  
Rack travel in mm : 7.30...7.50  
Del. quantity cm<sup>3</sup>/ : 5.2...6.0 \*  
100 s : (-)  
3rd speed rpm : 500  
Rack travel in mm : <7.50  
Del. quantity cm<sup>3</sup>/ : - \*\*  
100 s : (-)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 1.10...1.50  
2nd speed rpm : 500  
travel mm : 3.80...4.20  
3rd speed rpm : 850  
travel mm : 8.50...8.90  
4th speed rpm : 1150  
travel mm : 9.50...9.70  
5th speed rpm : 1400  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1200  
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1150  
Aneroid pressure h: 1600  
Del.quantity : 289.0...291.0  
1000 : (286.0...294.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 57...65

Testing:  
1st rack travel in: 12.20  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1275...1315  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 18...26

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.90  
Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 430...490

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 13.20...13.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.10  
2nd pressure hPa : 500  
Rack travel in m: 9.30...9.40  
3rd pressure hPa : 1150  
Rack travel in m: 11.80...12.20

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

H24

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.20  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0 \*  
1000 s: (-)

#### HIGH IDLE

1st version  
Speed rpm : 500  
Rack travel in mm : <8.00  
Del.quantity cm<sup>3</sup>/ : <50.0  
1000 s: (-)

2nd version  
Speed rpm : 500  
Rack travel in mm : 8.70  
Del.quantity cm<sup>3</sup>/ : 130.0  
1000 s: (-)

Remarks:

\* applies to cylinders 4, 5, 6, 8, 10  
and 12  
\*\* applies for cylinders 1, 2, 3, 7, 9  
and 11

#### APPLICATION

Ship

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAN 21,0 a2  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 640 814  
 Injection pump  
 Pump designation : PE12P120A520LS7812  
 EP type number : 0 412 620 807  
 Governor  
 Governor design. : RQV250...1150PA902  
 Governor no. : 0 421 813 720

Customer-spec. information

Customer : MAN  
 Engine : D2842LXE  
 1st version kW : 662.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 067  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.90...5.00  
 : (4.85...5.05)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 : 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 : 180-225-240-285-300-  
 Phasing : 345  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 12.20...12.30  
 Del.quantity cm3/ : 24.9...25.1  
 100 s: (24.6...25.4)  
 Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 500.0  
 Rack travel in mm : 8.7...8.9  
 Del.quantity cm3/ : 14.1...14.7  
 100 s: (13.8...15.0)  
 Spread cm3 : 0.8  
 100 s: (1.2)  
 3rd speed rpm : 250  
 Rack travel in mm : 7.30...7.50  
 Del.quantity cm3/ : 5.2...6.0 \*  
 100 s: (-)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 1.10...1.50  
 2nd speed rpm : 500  
 travel mm : 3.80...4.20  
 3rd speed rpm : 850  
 travel mm : 8.50...8.90  
 4th speed rpm : 1150  
 travel mm : 9.50...9.70  
 5th speed rpm : 1400  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1200  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150  
Aneroid pressure h: 1300  
Del.quantity : 249.0...251.0  
1000 : (246.0...254.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version:

Control lever  
position degrees: 57...65

Testing:

1st rack travel in: 11.20  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 18...26

Testing:

Speed rpm : 100  
Minimum rack trave: 8.90  
Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 430...490

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 12.20...12.30

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.10  
2nd pressure hPa : 270  
Rack travel in m: 9.30...9.40  
3rd pressure hPa : 790  
Rack travel in m: 11.30...11.70

START CUT-OUT

Speed 1/min : 200 (220)

H26

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0 \*  
1000 s: (-)

HIGH IDLE

1st version

Speed rpm : 500\*\*  
Rack travel in mm : <7.50  
Del.quantity cm<sup>3</sup>/ : <0  
1000 s: (-)

2nd version

Speed rpm : 500\*\*  
Rack travel in mm : <8.00  
Del.quantity cm<sup>3</sup>/ : <50.0  
1000 s: (-)

3rd version

Speed rpm : 500  
Rack travel in mm : 8.70  
Del.quantity cm<sup>3</sup>/ : 125.0  
1000 s: (-)

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Del.quantity cm<sup>3</sup>/ : 52.0...60.0 \*  
1000 s: (-)

Remarks:

\* applies to cylinders 4, 5, 6, 8, 10 and 12  
\*\* applies for cylinders 1, 2, 3, 7, 9 and 11

APPLICATION

Ship



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,0 v2  
Edition : 24.07.87  
Replaces : 9.3.87  
Test oil : ISO-4113

Combination no. : 0 402 646 804

Injection pump  
Pump designation : PE6P120A72ORS7004  
EP type number : 0 412 626 801  
Governor  
Governor design. : RQ900PA528  
Governor no. : 0 421 801 127

Customer-spec. information  
Customer : SAAB - SCANIA

Engine : DS11 43,44,45

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
                  : (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.80...12.90

Del.quantity cm<sup>3</sup>/ : 20.7...20.9

100 s: (20.4...21.2)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 850

Del.quantity : 207.0...209.0

1000 : (204.0...212.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 22...30

### Testing:

1st rack travel in: 11.80

Speed rpm : 900...905

2nd rack travel in: 4.00

Speed rpm : 941...955

4th rack travel in: 1000

Speed rpm : 0.00...1.00

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 240.0...290.0

1000 s: (-)

Rack travel in mm : 20.00...21.00

## HIGH IDLE

### 1st version

Rack travel in mm : 4.90...5.10

Spread      cm<sup>3</sup> : 4.00  
             1000 s: (7.00)

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

ADDITIONAL INFORMATION

Check and set without ROBO diaphragam

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on Oct. 17, 1988

Engine model DS 11 - 17° before top  
dead center.

Engine model DSI 11 - 16° before top  
dead center.

Firing sequence of engine:  
1-5-3-6-2-4.



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : VOL 16,0 a  
 Edition : 10.02.89  
 Replaces : 24.7.87  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 832  
 Injection pump  
 Pump designation : PE6P130A72DRS7122  
 EP type number : 0 412 636 804  
 Governor  
 Governor design. : RQV225...930PA799  
 Governor no. : 0 421 813 544

Customer-spec. information  
 Customer : VOLVO

Engine : TD160

1st version kW : 343.0  
 Rated speed : 1860

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 27.4...27.7

100 s: (27.1...28.1)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 250.0  
 Rack travel in mm : 5.0...5.2  
 Del.quantity cm3/ : 2.5...3.0

100 s: (2.3...3.3)

Spread cm3 : 0.5

100 s: (0.8)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250  
 travel mm : 1.00...1.40

2nd speed rpm : 350  
 travel mm : 2.10...2.70

3rd speed rpm : 700  
 travel mm : 6.40...6.60

4th speed rpm : 960  
 travel mm : 7.60...7.80

5th speed rpm : 1045  
 travel mm : 9.00...9.40

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1010

Rack travel in mm : 6.70...9.30

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 700

Del.quantity : 274.5...277.5  
1000 : (271.0...281.0)  
Spread cm3 : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 57...65

Testing:  
1st rack travel in: 11.90  
Speed rpm : 960...972  
2nd rack travel in: 4.00  
Speed rpm : 1030...1060  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 5...13

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 5.00...5.20

CONSTANT REGULATION  
Speed rpm : 225...400

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 12.90...13.00

Measurement  
Speed l/min : 500

1st pressure hPa : -  
Rack travel in m: 9.70...9.80  
2nd pressure hPa : 80  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 540  
Rack travel in m: 12.50...12.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm3/ : 182.5...185.5  
1000 s: (179.0...189.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 960...972

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 125.0...145.0  
Rack travel in mm : 9.70...9.80

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.00...5.20  
Del.quantity cm3/ : 25.5...30.5  
1000 s: (23.0...33.0)  
Spread cm3 : 5.00  
1000 s: (8.00)

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : SCA 11,1 b  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 836  
 Injection pump  
 Pump designation : PE6P120A72ORS7126  
 EP type number : 0 412 626 815  
 Governor  
 Governor design. : RQV200...1000PA725-1  
 Governor no. : 0 421 813 552

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DSC11 18

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700  
 Rack travel in mm : 14.10...14.20  
 Del.quantity cm<sup>3</sup>/ : 23.4...23.6  
 100 s: (23.1...23.9)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

2nd speed rpm : 225.0  
 Rack travel in mm : 4.5...4.9  
 Del.quantity cm<sup>3</sup>/ : 1.5...1.9  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 225  
 travel mm : 1.20...1.60  
 2nd speed rpm : 350  
 travel mm : 2.40...3.00  
 3rd speed rpm : 650  
 travel mm : 4.40...5.00  
 4th speed rpm : 1045  
 travel mm : 8.40...8.60  
 5th speed rpm : 1160  
 travel mm : 9.90...10.30

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1040  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 234.0...236.0  
 1000 : (231.0...239.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 59...67

Testing:  
1st rack travel in: 13.10  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.10  
Speed rpm : 225  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00  
Speed rpm : 320...380

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 14.10...14.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.30...10.70  
2nd pressure hPa : 575  
Rack travel in m: 13.00...13.10  
3rd pressure hPa : 405  
Rack travel in m: 11.10...11.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 223.0...231.0  
1000 s: (221.0...233.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 150.0...154.0  
1000 s: (148.0...156.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.10  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 275.0...325.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.50...4.70

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-21

Start of delivery - engine: 13° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 16,0 b  
Edition : 10.02.89  
Replaces : 3.4.87  
Test oil : ISO-4113  
Combination no. : 0 402 646 837  
Injection pump  
Pump designation : PE6P130A720RS7134  
EP type number : 0 412 636 805  
Governor  
Governor design. : RQV225...930PA849  
Governor no. : 0 421 813 600

## Customer-spec. information

Customer : VOLVO

Engine : TD160

1st version kW : 320.0  
Rated speed : 1860

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
                  : (3.55...3.75)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.90...13.00

Del.quantity cm<sup>3</sup>/ : 27.5...27.7

100 s: (27.1...28.1)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

2nd speed rpm : 225.0

Rack travel in mm : 5.1...5.3

Del.quantity cm<sup>3</sup>/ : 2.5...2.9

100 s: (2.2...3.2)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
travel mm : 0.90...1.00

2nd speed rpm : 440  
travel mm : 3.60...3.90

3rd speed rpm : 750  
travel mm : 6.40...6.60

4th speed rpm : 980  
travel mm : 7.90...8.10

5th speed rpm : 1050  
travel mm : 9.20...9.40

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1010

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 700

Del. quantity : 275.0...277.0  
1000 : (271.0...281.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 58...66

#### Testing:

1st rack travel in: 11.90  
Speed rpm : 975...985  
2nd rack travel in: 4.00  
Speed rpm : 1040...1070  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 5...13

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.60  
Speed rpm : 225  
Rack travel in mm : 5.10...5.30

#### CONSTANT REGULATION

Speed rpm : 225...390

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 12.90...13.00

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.70...9.80  
2nd pressure hPa : 550  
Rack travel in m: 12.70...12.80  
3rd pressure hPa : 100  
Rack travel in m: 10.00...10.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 182.0...186.0  
1000 s: (179.0...189.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 975...985

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 125.0...145.0  
1000 s: (-)  
Rack travel in mm : 9.70...9.80

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 5.10...5.30  
Del. quantity cm<sup>3</sup>/ : 25.0...29.0  
1000 s: (22.0...32.0)  
Spread cm<sup>3</sup> : 4.00  
1000 s: (8.00)

#### Remarks:

:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : SCA 11,1 d  
 Edition : 10.02.89  
 Replaces : 2.11.87  
 Test oil : ISO-4113

Combination no. : 0 402 646 844

Injection pump  
 Pump designation : PE6P120A72ORS7017  
 EP type number : 0 412 626 818  
 Governor  
 Governor design. : RQV200...1000PA539-7  
 Governor no. : 0 421 813 631

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DSC 11 12

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 019

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700

---

Rack travel in mm : 14.50...14.60

---

Del.quantity cm3/ : 22.0...22.2  
 100 s: (21.7...22.5)

---

Spread cm3 : 0.6  
 100 s: (0.9)

2nd speed rpm : 225.0  
 Rack travel in mm : 5.3...5.7  
 Del.quantity cm3/ : 1.8...2.2  
 100 s: (-)

Spread cm3 : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 225  
 travel mm : 1.20...1.60

2nd speed rpm : 350  
 travel mm : 2.40...3.00

3rd speed rpm : 650  
 travel mm : 4.50...5.10

4th speed rpm : 1045  
 travel mm : 8.40...8.60

5th speed rpm : 1165  
 travel mm : 10.00...10.40

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1050  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 220.0...222.0  
 1000 : (217.0...225.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 59...67

Testing:  
1st rack travel in: 13.50  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 7...15

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.90  
Speed rpm : 225  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.00  
Speed rpm : 380...440

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 14.50...14.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.30...12.70  
2nd pressure hPa : 480  
Rack travel in m: 14.10...14.20  
3rd pressure hPa : 285  
Rack travel in m: 13.00...13.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 210.0...218.0  
1000 s: (208.0...220.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 169.0...173.0  
1000 s: (167.0...175.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 5.30...5.50

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-21

Start of delivery - engine: 16° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,1 c  
Edition : 10.02.89  
Replaces : 5.2.88  
Test oil : ISO-4113  
Combination no. : 0 402 646 845  
Injection pump  
Pump designation : PE6P120A72ORS7139  
EP type number : 0 412 626 819  
Governor  
Governor design. : RQV200...1000PA725-2  
Governor no. : 0 421 813 632

Customer-spec. information  
Customer : SAAB-SCANIA

Engine : DSC11 13

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 1 688 901 019  
Opening  
pressure, bar : 207...210  
Orifice plate  
diameter mm : 0,8  
Test Lines : 1 680 750 015  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600  
(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
Prestroke mm : 5.00...5.10  
                  : (4.95...5.15)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4  
Phasing : 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)  
Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700  
Rack travel in mm : 15.20...15.30  
Del.quantity cm<sup>3</sup>/ : 23.6...23.8  
100 s: (23.3...24.1)  
Spread cm<sup>3</sup> : 0.6  
100 s: (0.9)  
2nd speed rpm : 225.0  
Rack travel in mm : 5.3...5.7  
Del.quantity cm<sup>3</sup>/ : 1.8...2.2  
100 s: (-)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.6)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
travel mm : 1.20...1.60  
2nd speed rpm : 350  
travel mm : 2.40...3.00  
3rd speed rpm : 650  
travel mm : 4.40...5.00  
4th speed rpm : 1045  
travel mm : 8.40...8.60  
5th speed rpm : 1170  
travel mm : 10.10...10.50

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1050  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Aneroid pressure h: 900  
Del.quantity : 236.0...238.0  
1000 : (233.0...241.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 59...67

Testing:  
1st rack travel in: 14.20  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.90  
Speed rpm : 225  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.00  
Speed rpm : 380...440

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 15.20...15.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.30...12.70  
2nd pressure hPa : 535  
Rack travel in m: 14.60...14.70  
3rd pressure hPa : 290  
Rack travel in m: 13.10...13.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 226.0...234.0  
1000 s: (224.0...236.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 169.0...173.0  
1000 s: (167.0...175.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.20  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 5.30...5.50

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-21

Start of delivery - engine: 15° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 e  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 846  
 Injection pump  
 Pump designation : PE6P120A72ORS7018  
 EP type number : 0 412 626 821  
 Governor  
 Governor design. : RQV200...1000PA539-8  
 Governor no. : 0 421 813 635

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS11 73

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 13.20...13.30  
 Del.quantity cm<sup>3</sup>/ : 19.2...19.4  
 100 s : (18.9...19.7)  
 Spread cm<sup>3</sup> : 0.6  
 100 s : (0.9)

2nd speed rpm : 225.0  
 Rack travel in mm : 4.7...5.1  
 Del.quantity cm<sup>3</sup>/ : 1.4...1.8  
 100 s : (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 1.20...1.60  
 2nd speed rpm : 350  
 travel mm : 2.40...3.00  
 3rd speed rpm : 650  
 travel mm : 4.50...5.10  
 4th speed rpm : 1045  
 travel mm : 8.40...8.60  
 5th speed rpm : 1150  
 travel mm : 9.80...10.20

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1050  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 192.0...194.0  
 1000 : (189.0...197.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 58...66

Testing:  
1st rack travel in: 12.20  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1135...1165  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 6...14

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.30  
Speed rpm : 225  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 350...410

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.20...13.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.20...11.60  
2nd pressure hPa : 405  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 255  
Rack travel in m: 11.80...12.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 187.0...195.0  
1000 s: (185.0...197.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 143.0...147.0  
1000 s: (141.0...149.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.20  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 280.0...330.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.70...4.90

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-12

Start of delivery - engine: 14° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : SCA 9,0 l  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 847  
 Injection pump  
 Pump designation : PE6P120A32ORS7138  
 EP type number : 0 412 626 822  
 Governor  
 Governor design. : RQV200...1100PA712-2  
 Governor no. : 0 421 813 636

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DSC9 02

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700  
 Rack travel in mm : 12.90...13.00  
 Del.quantity cm<sup>3</sup>/ : 18.4...18.6  
 100 s : (18.1...18.9)  
 Spread cm<sup>3</sup> : 0.6  
 100 s : (0.9)  
 2nd speed rpm : 225.0  
 Rack travel in mm : 4.9...5.3  
 Del.quantity cm<sup>3</sup>/ : 2.1...2.5  
 100 s : (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

**(B) Setting of injection pump  
 with governor**

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 225  
 travel mm : 0.90...1.30  
 2nd speed rpm : 350  
 travel mm : 2.50...3.10  
 3rd speed rpm : 650  
 travel mm : 5.40...6.00  
 4th speed rpm : 1145  
 travel mm : 8.90...9.10  
 5th speed rpm : 1290  
 travel mm : 10.20...10.60

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1120  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 184.0...186.0  
 1000 : (181.0...189.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 60...68

#### Testing:

1st rack travel in: 11.90  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1275...1305  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 6...14

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 225  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 300...360

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.90...13.00

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.90...11.30  
2nd pressure hPa : 345  
Rack travel in m: 12.40...12.50  
3rd pressure hPa : 175  
Rack travel in m: 11.30...11.50

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 179.0...187.0  
1000 s: (177.0...189.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 132.0...136.0  
1000 s: (130.0...138.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 270.0...320.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.90...5.10

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-12

Start of delivery - engine: 15° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : SCA 9,0 L 1  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 848  
 Injection pump  
 Pump designation : PE6P120A32ORS7138  
 EP type number : 0 412 626 822  
 Governor  
 Governor design. : RQV200...1100PA712-3  
 Governor no. : 0 421 813 637

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS9 05

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 4.40...4.50  
 : (4.35...5.55)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700  
 Rack travel in mm : 12.20...12.30  
 Del. quantity cm<sup>3</sup>/ : 16.5...16.7  
 100 s: (16.2...17.0)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

2nd speed rpm : 225.0  
 Rack travel in mm : 4.9...5.3  
 Del. quantity cm<sup>3</sup>/ : 2.1...2.5  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 225  
 travel mm : 0.90...1.30  
 2nd speed rpm : 350  
 travel mm : 2.50...3.10  
 3rd speed rpm : 650  
 travel mm : 5.40...6.00  
 4th speed rpm : 1145  
 travel mm : 8.90...9.10  
 5th speed rpm : 1280  
 travel mm : 10.10...10.50

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1120  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del. quantity : 165.0...167.0  
 1000 : (162.0...170.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 59...67

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1265...1295  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 6...14

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 225  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 300...360

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.20...12.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...11.00  
2nd pressure hPa : 360  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 240  
Rack travel in m: 11.00...11.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 163.0...171.0  
1000 s: (161.0...173.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 125.0...129.0  
1000 s: (123.0...131.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 270.0...320.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.90...5.10

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-12

Start of delivery - engine: 13° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 16,2 a  
 Edition : 10.02.89  
 Replaces : 2.6.87  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 849  
 Injection pump  
 Pump designation : PE6P130A72ORS7137  
 EP type number : 0 412 636 806  
 Governor  
 Governor design. : RQ750PA865  
 Governor no. : 0 421 801 401

Customer-spec. information  
 Customer : VOLVO

Engine : TID162 AG

1st version kW : 350.0  
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.40...11.50

Del. quantity cm<sup>3</sup>/ : 34.1...34.3

100 s: (33.8...34.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del. quantity : 341.0...343.0

1000 : (338.0...346.0)

Spread

cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Testing:

1st rack travel in: 10.40

Speed rpm : 750...755

2nd rack travel in: 4.00

Speed rpm : 777...790

4th rack travel in: 840

Speed rpm : 0.00...1.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.40

Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 270.0...310.0  
1000 s: (260.0...320.0)

HIGH IDLE

1st version

Speed rpm : 781  
Spread cm3 : 5.00  
1000 s: (7.00)

Remarks:

:

APPLICATION

Generator



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : PEN 16,2 a  
 Edition : 10.02.89  
 Replaces : 20.11.87  
 Test oil : ISO-4113

Combination no. : 0 402 646 850

Injection pump  
 Pump designation : PE6P130A72ORS7140  
 EP type number : 0 412 636 807  
 Governor  
 Governor design. : RQV250...900PA869  
 Governor no. : 0 421 813 634

Customer-spec. information  
 Customer : VOLVO-PENTA

Engine : TID 162 AP

1st version kW : 357.0  
 Rated speed : 1800

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700

Rack travel in mm : 10.20...10.30

Del. quantity cm<sup>3</sup>/ : 29.2...29.4

100 s: (28.8...29.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 3.7...3.9

Del. quantity cm<sup>3</sup>/ : 1.7...2.2

100 s: (1.4...2.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.7)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250  
 travel mm : 0.90...1.30

2nd speed rpm : 350  
 travel mm : 2.00...2.60

3rd speed rpm : 700  
 travel mm : 4.40...5.00

4th speed rpm : 925  
 travel mm : 7.30...7.50

5th speed rpm : 985  
 travel mm : 8.10...8.50

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 980

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 700

Del.quantity : 292.0...294.0  
1000 : (288.0...298.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 9.20  
Speed rpm : 920...925  
2nd rack travel in: 4.00  
Speed rpm : 970...1000  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 6...14

Testing:  
Speed rpm : 100  
Minimum rack travel: 5.30  
Speed rpm : 250  
Rack travel in mm : 3.70...3.90

CONSTANT REGULATION  
Speed rpm : 250...360

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.20  
Speed rpm : 920...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...260.0  
1000 s: (-)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 3.70...3.90  
Del.quantity cm<sup>3</sup>/ : 17.0...22.0  
1000 s: (14.5...24.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)

#### Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 f  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 854  
 Injection pump  
 Pump designation : PE6P120A72ORS7019  
 EP type number : 0 412 626 823  
 Governor  
 Governor design. : RQ200/1000PA713-2  
 Govenner no. : 0 421 801 408

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS11 71

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.40...11.50

Del.quantity cm<sup>3</sup>/ : 16.1...16.3

100 s: (15.8...16.6)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.7...5.1

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (-)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 161.0...163.0

1000 : (158.0...166.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.5

Testing:

1st rack travel in: 10.40

Speed rpm : 1045...1060

2nd rack travel in: 4.00

Speed rpm : 1170...1200

4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 225  
Rack travel in mm : 4.8

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.30  
Speed rpm : 225  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 310...350

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.40...11.50

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.30...9.70  
2nd pressure hPa : 320  
Rack travel in m: 10.80...10.90  
3rd pressure hPa : 180  
Rack travel in m: 9.90...10.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 174.0...182.0  
1000 s: (172.0...184.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 112.0...116.0  
1000 s: (110.0...118.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 1045...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 275.0...325.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.70...4.90

#### Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

See VDT-I-460/138.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on Sep. 5, 1988

Start of delivery - engine: 14° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

Omnibus

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : SCA 11,1 g  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 855  
 Injection pump  
 Pump designation : PE6P120A72ORS7018  
 EP type number : 0 412 626 821  
 Governor  
 Governor design. : RQ200/1000PA713-3  
 Governor no. : 0 421 801 414

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS11 73

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4  
 Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700  
 Rack travel in mm : 13.20...13.30  
 Del. quantity cm<sup>3</sup>/ : 19.2...19.4  
 100 s : (18.9...19.7)  
 Spread cm<sup>3</sup> : 0.6  
 100 s : (0.9)  
 2nd speed rpm : 225.0  
 Rack travel in mm : 4.7...5.1  
 Del. quantity cm<sup>3</sup>/ : 1.4...1.8  
 100 s : (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

**1st version**

Speed rpm : 700  
 Aneroid pressure h : 900  
 Del. quantity : 192.0...194.0  
 1000 : (189.0...197.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

**RATED SPEED**

**1st version**

Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 16.5

**Testing:**

1st rack travel in: 12.20  
 Speed rpm : 1045...1060  
 2nd rack travel in: 4.00  
 Speed rpm : 1190...1220

4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 225  
Rack travel in mm : 4.8

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.30  
Speed rpm : 225  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 310...350

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.20...13.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.20...11.60  
2nd pressure hPa : 405  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 255  
Rack travel in m: 11.80...12.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 187.0...195.0  
1000 s: (185.0...197.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 143.0...147.0  
1000 s: (141.0...149.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.20  
Speed rpm : 1045...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 280.0...330.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.70...4.90

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-12

Start of delivery - engine: 14° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

Omnibus



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : PEN 16,2 b  
 Edition : 10.02.89  
 Replaces : 12.2.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 857  
 Injection pump  
 Pump designation : PE6P130A720RS7150  
 EP type number : 0 412 636 808  
 Governor  
 Governor design. : RQV250...900PA881  
 Governor no. : 0 421 813 676

Customer-spec. information  
 Customer : VOLVO-PENTA

Engine : TAMD 162 (HD)

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 3.60...3.70  
 : (3.55...3.75)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700  
 Rack travel in mm : 10.30...10.40  
 Del.quantity cm<sup>3</sup>/ : 29.7...29.9  
 100 s : (29.3...30.3)  
 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)  
 2nd speed rpm : 250.0  
 Rack travel in mm : 3.7...3.9  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.2  
 100 s : (1.4...2.4)  
 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.7)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250  
 travel mm : 0.90...1.30  
 2nd speed rpm : 350  
 travel mm : 2.00...2.60  
 3rd speed rpm : 700  
 travel mm : 4.40...5.00  
 4th speed rpm : 925  
 travel mm : 7.30...7.50  
 5th speed rpm : 985  
 travel mm : 8.10...8.50

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 980  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 297.0...299.0  
 1000 : (293.0...303.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

#### Testing:

1st rack travel in: 9.30  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 975...1005  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 6...14

#### Testing:

Speed rpm : 100  
Minimum rack travel: 5.30  
Speed rpm : 250  
Rack travel in mm : 3.70...3.90

#### CONSTANT REGULATION

Speed rpm : 250...400

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 10.30...10.40

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 7.70...7.90  
2nd pressure hPa : 310  
Rack travel in m: 7.90...8.00  
3rd pressure hPa : 660  
Rack travel in m: 9.90...10.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 192.0...196.0  
1000 s: (189.0...199.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.30  
Speed rpm : 925...935

#### STARTING FUEL DELIVERY

Speed rpm : 100

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 3.70...3.90  
Del.quantity cm<sup>3</sup>/ : 17.0...22.0  
1000 s: (14.5...24.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,1 h  
Edition : 10.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 646 858  
Injection pump  
Pump designation : PE6P120A72ORS7151  
EP type number : 0 412 626 824  
Governor  
Governor design. : RQ200/900PA713-4  
Governor no. : 0 421 801 424

Customer-spec. information  
Customer : SAAB-SCANIA

Engine : DSC11 04

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 1 688 901 019  
Opening  
pressure, bar : 207...210  
Orifice plate  
diameter mm : 0,8  
Test lines : 1 680 750 015  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
Prestroke mm : 4.40...4.50  
                  : (4.35...4.55)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700  
Rack travel in mm : 12.70...12.80  
Del.quantity cm<sup>3</sup>/ : 17.4...17.6  
100 s: (17.1...17.9)  
Spread cm<sup>3</sup> : 0.6  
100 s: (0.9)

2nd speed rpm : 225.0  
Rack travel in mm : 4.8...5.2  
Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
100 s: (-)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.6)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -2  
Speed rpm : 600  
Rack travel in mm : 0.00...15.20

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Aneroid pressure h: 900  
Del.quantity : 174.0...176.0  
1000 : (171.0...179.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

## RATED SPEED

1st version  
Setting point:  
Speed rpm : 600  
Rack travel in mm : 7.6

Testing:  
1st rack travel in: 11.70  
Speed rpm : 945...960  
2nd rack travel in: 4.00  
Speed rpm : 1050...1080

4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 225  
Rack travel in mm : 4.9

#### Testing:

Speed rpm : 100  
Minimum rack trave: 6.40  
Speed rpm : 225  
Rack travel in mm : 4.80...5.00  
Rack travel in mm : 2.00  
Speed rpm : 310...350

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.70...12.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.40...11.80  
2nd pressure hPa : 395  
Rack travel in m: 12.50...12.60  
3rd pressure hPa : 290  
Rack travel in m: 11.90...12.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 900  
Del.quantity cm3/ : 171.0...179.0  
1000 s: (169.0...181.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...149.0  
1000 s: (143.0...151.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 945...960

#### LOW IDLE

K01

Speed rpm : 225  
Rack travel in mm : 4.80...5.00

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on Sep. 5, 1988

Start of delivery - engine: 9° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 9,0 l 2  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 860  
 Injection pump  
 Pump designation : PE6P120A320RS7138  
 EP type number : 0 412 626 822  
 Governor  
 Governor design. : RQV350...1100PA795-1  
 Governor no. : 0 421 813 693

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS9 52,53,54,55

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 9.00...12.00

K02

Firing order : 1- 5- 3- 6- 2- 4  
 Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 12.20...12.30  
 Del.quantity cm<sup>3</sup>/ : 16.5...16.7  
 100 s: (16.2...17.0)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 4.3...4.9  
 Del.quantity cm<sup>3</sup>/ : 2.0...2.4  
 100 s: (1.7...2.7)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.30...1.70  
 2nd speed rpm : 650  
 travel mm : 4.10...4.70  
 3rd speed rpm : 1145  
 travel mm : 7.80...8.00  
 4th speed rpm : 1255  
 travel mm : 8.80...9.20

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1180  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del.quantity : 165.0...167.0  
 1000 : (162.0...170.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 42...50

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.10  
Speed rpm : 350  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00  
Speed rpm : 370...430

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1100  
Del. quantity cm<sup>3</sup>/ : 163.0...171.0  
1000 s: (161.0...173.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 270.0...320.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.30...4.90  
Del. quantity cm<sup>3</sup>/ : 20.0...24.0  
1000 s: (17.0...27.0)  
Spread cm<sup>3</sup> : 3.00  
1000 s: (6.00)

Remarks:

K03

:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on Oct. 17, 1988

Start of delivery - engine: 13° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : SCA 9,0 L 3  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 861  
 Injection pump  
 Pump designation : PE6P120A32ORS7138  
 EP type number : 0 412 626 822  
 Governor  
 Governor design. : RQV300....925PA712-4  
 Governor no. : 0 421 813 701

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS9 52,53,54,55

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 9.00...12.00

KD4

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700  
 Rack travel in mm : 12.20...12.30  
 Del. quantity cm<sup>3</sup>/ : 16.5...16.7  
 100 s: (16.2...17.0)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.6...5.0  
 Del. quantity cm<sup>3</sup>/ : 2.0...2.4  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

**(B) Setting of injection pump  
 with governor**

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300  
 travel mm : 1.40...1.80  
 2nd speed rpm : 350  
 travel mm : 1.90...2.50  
 3rd speed rpm : 650  
 travel mm : 4.70...5.30  
 4th speed rpm : 970  
 travel mm : 8.40...8.60  
 5th speed rpm : 1045  
 travel mm : 9.30...9.70

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 970  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Del. quantity : 165.0...167.0  
 1000 : (162.0...170.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

## RATED SPEED

1st version

Control lever  
position degrees: 44...52

Testing:

1st rack travel in: 11.20  
Speed rpm : 965...975  
2nd rack travel in: 4.00  
Speed rpm : 1030...1060  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 12...20

Testing:

Speed rpm : 100  
Minimum rack travel: 6.20  
Speed rpm : 300  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 330...390

## FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1100  
Del. quantity cm<sup>3</sup>/ : 163.0...171.0  
1000 s: (161.0...173.0)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 965...975

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 270.0...320.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

## LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.60...4.80

Remarks:

:

K05

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

## ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-12

Start of delivery - engine: 13° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 14,7 a 2  
 Edition : 28.11.88  
 Replaces : 6.86  
 Test oil : ISO-4113

Combination no. : 0 402 648 817

Injection pump  
 Pump designation : PE8P120A320LS7801  
 EP type number : 0 412 628 806  
 Governor  
 Governor design. : RQ300/1050PA762-5  
 Governor no. : 0 421 801 399

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM442 A

1st version kW : 260.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

**BASIC SETTING**

1st speed rpm : 500

Rack travel in mm : 14.10...14.30

Del.quantity cm3/ : 20.3...20.5

100 s: (20.0...20.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.4

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 500

Aneroid pressure h: 650

Del.quantity : 203.0...205.0

1000 : (200.0...208.0)

Spread cm3 : 5.00

1000 : (9.00)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.80  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.00...6.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.75  
2nd speed rpm : 1050  
Rack travel in m: 12.80...13.00  
3rd speed rpm : 850  
Rack travel in m: 13.70...14.00  
4th speed rpm : 700  
Rack travel in m: 14.40...14.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 12.40...12.60  
2nd pressure hPa : 400  
Rack travel in m: 13.40...13.70  
3rd pressure hPa : 850  
Rack travel in m: 14.20...14.30 \*  
4th pressure hPa : -  
Rack travel in m: 11.40...11.70  
5th pressure hPa : 1050  
Rack travel in m: 14.40...14.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1050  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 180.0...183.0  
1000 s: (177.0...186.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1050  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 215.0...219.0  
1000 s: (212.0...222.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1050  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 206.0...210.0  
1000 s: (203.0...213.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 175.0...190.0  
1000 s: (171.0...194.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 14,7 b 1  
 Edition : 03.03.89  
 Replaces : 12.9.86  
 Test oil : ISO-4113

Combination no. : 0 402 648 825

Injection pump  
 Pump designation : PE8P120A320LS7801  
 EP type number : 0 412 628 806  
 Governor  
 Governor design. : RQV300..1050PA797-3  
 Governor no. : 0 421 813 627

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM442 A

1st version kW : 260.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow quantity min. 1/h: 100...120

Test nozzle holder assembly : 1 688 901 019

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

**BASIC SETTING**

1st speed rpm : 500

---

Rack travel in mm : 14.10...14.30

---

Del.quantity cm3/ : 20.3...20.5

---

100 s: (20.0...20.8)

---

Spread cm3 : 0.5

---

100 s: (0.9)

---

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.4

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300  
 travel mm : 1.20...1.40

2nd speed rpm : 600  
 travel mm : 4.90...5.10

3rd speed rpm : 1075  
 travel mm : 7.40...7.60

4th speed rpm : 1100  
 travel mm : 8.00...8.20

5th speed rpm : 1150  
 travel mm : 9.00...9.20

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 500  
Aneroid pressure h: 650  
Del.quantity : 203.0...205.0  
1000 : (200.0...208.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 51...59

Testing:  
1st rack travel in: 11.80  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 13...21

Testing:  
Speed rpm : 200  
Minimum rack trave: 7.70  
Speed rpm : 300  
Rack travel in mm : 6.00...6.40

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : 1.40  
2nd speed rpm : 1050  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 850  
Rack travel in m: 13.70...14.00  
4th speed rpm : 700  
Rack travel in m: 14.30...14.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 14.10...14.30

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 12.40...12.60

2nd pressure hPa : 400  
Rack travel in m: 13.40...13.70  
3rd pressure hPa : 850  
Rack travel in m: 14.20...14.30  
4th pressure hPa : -  
Rack travel in m: 11.30...11.60  
5th pressure hPa : 1050  
Rack travel in m: 14.30...14.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1050  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 180.0...183.0  
1000 s: (177.0...186.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1050  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 215.0...219.0  
1000 s: (212.0...222.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1050  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 206.0...210.0  
1000 s: (203.0...213.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 175.0...190.0  
1000 s: (171.0...194.0)

Remarks: :

\* Increase in control-rod travel with respect to setting at least 0.1 mm



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 14,0 h1  
 Edition : 07.02.89  
 Replaces : 15.1.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 836  
 Injection pump  
 Pump designation : PE8P120A920/4LS7125T  
 EP type number : 0 412 628 824  
 Governor  
 Governor design. : RQV200...950PA736-4  
 Governor no. : 0 421 813 646

Customer spec. information  
 Customer : SAAB-SCANIA

Engine : DSC14 03 L09,L10

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 1 688 901 019  
 Opening pressure, bar : 207...210  
 Orifice plate diameter mm : 0,8  
 Test lines : 1 680 750 015

Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-  
 6- 8

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 13.80...13.90  
 Del. quantity cm3/ : 22.1...22.3  
 100 s : (21.8...22.6)  
 Spread cm3 : 0.6  
 100 s : (0.9)

2nd speed rpm : 225.0  
 Rack travel in mm : 4.9...5.3  
 Del. quantity cm3/ : 1.6...2.0  
 100 s : (-)  
 Spread cm3 : 0.3  
 100 s : (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 1.20...1.60  
 2nd speed rpm : 350  
 travel mm : 2.30...2.90  
 3rd speed rpm : 650  
 travel mm : 4.40...5.00  
 4th speed rpm : 995  
 travel mm : 7.70...7.90  
 5th speed rpm : 1125  
 travel mm : 9.30...9.70

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1040  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del. quantity : 221.0...223.0  
 1000 : (218.0...226.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 56...64

Testing:  
1st rack travel in: 12.80  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 225  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 360...420

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.80...13.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...11.00  
2nd pressure hPa : 445  
Rack travel in m: 12.90...13.00  
3rd pressure hPa : 325  
Rack travel in m: 11.40...11.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 950  
Del. quantity cm<sup>3</sup>/ : 211.0...219.0  
1000 s: (209.0...221.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del. quantity cm<sup>3</sup>/ : 138.0...142.0  
1000 s: (136.0...144.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.90...5.10

#### Remarks:

Test specifications approved by Scania  
on 1987-12-15

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

Start of delivery - engine: 16° before  
TDC

Engine firing sequence: 1-5-4-2-6-3-7-8

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 14,0 h2
Edition : 07.02.89
Replaces : 29.1.88
Test oil : ISO-4113
Combination no. : 0 402 648 839
Injection pump
Pump designation : PE8P120A920/4LS7125T
EP type number : 0 412 628 824
Governor
Governor design. : RQV200...950PA736-1
Governor no. : 0 421 813 551

Customer-spec. information
Customer : SAAB-SCANIA

Engine : DSC14 03

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42
Overflow valve : 1 417 413 025
Inlet press., bar : 1.50
Test nozzle holder assembly : 1 688 901 019
Opening pressure, bar : 207...210
Orifice plate diameter mm : 0,8
Test lines : 1 680 750 015

Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
Prestroke mm : 5.00...5.10
: (4.95...5.15)
Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-
6- 8

Phasing : 0-45-90-135-180-225-
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
Rack travel in mm : 13.80...13.90
Del.quantity cm3/ : 22.1...22.3
100 s: (21.8...22.6)
Spread cm3 : 0.6
100 s: (0.9)

2nd speed rpm : 225.0
Rack travel in mm : 4.9...5.3
Del.quantity cm3/ : 1.6...2.0
100 s: (-)
Spread cm3 : 0.3
100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL
1st speed rpm : 225
travel mm : 1.20...1.60
2nd speed rpm : 350
travel mm : 2.30...2.90
3rd speed rpm : 650
travel mm : 4.40...5.00
4th speed rpm : 995
travel mm : 7.70...7.90
5th speed rpm : 1125
travel mm : 9.30...9.70

GUIDE SLEEVE POSITION
Control-lever position
Degree: -1
Speed rpm : 1040
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 700
Aneroid pressure h: 900
Del.quantity : 221.0...223.0
1000 : (218.0...226.0)



Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 56...64

Testing:  
1st rack travel in: 12.80  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 6...14

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 225  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 360...420

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.80...13.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.20...11.60  
2nd pressure hPa : 365  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 215  
Rack travel in m: 11.90...12.10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 211.0...219.0  
1000 s: (209.0...221.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 158.0...162.0  
1000 s: (156.0...164.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.80  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.90...5.10

Remarks:

Test specifications approved by Scania  
on 1987-12-15

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

Start of delivery - engine: 16° before  
TDC

Engine firing sequence: 1-5-4-2-6-3-7-8

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 14,7 j  
 Edition : 07.02.89  
 Replaces : 8.6.88  
 Test oil : ISO-4113

Combination no. : 0 402 648 844

Injection pump  
 Pump designation : PE8P120A320LS7816  
 EP type number : 0 412 628 829  
 Governor  
 Governor design. : RQ300/1050PA717-2  
 Governor no. : 0 421 801 439

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM442 LA

1st version kw : 353.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

**BASIC SETTING**

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del.quantity cm<sup>3</sup>/ : 23.4...23.7

100 s: (23.1...24.0)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 234.0...237.0

1000 : (231.0...240.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.40  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.40  
2nd speed rpm : 1050  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 800  
Rack travel in m: 14.90...15.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.60...13.80

Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 650  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1050  
Rack travel in m: 13.70...13.90 \*  
4th pressure hPa : -  
Rack travel in m: 9.90...10.20  
5th pressure hPa : 1500  
Rack travel in m: 14.80...15.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 252.0...256.0  
1000 s: (249.0...259.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 263.0...267.0  
1000 s: (260.0...270.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : WAU 24,0 a  
Edition : 17.02.89  
Replaces : 5.8.88  
Test oil : ISO-4113  
  
Combination no. : 0 402 648 847  
  
Injection pump  
Pump designation : PE8P130A920/4RS7158  
EP type number : 0 412 638 801  
Governor  
Governor design. : RQV350...900PA760-1  
Governor no. : 0 421 813 617

Customer-spec. information  
Customer : WAUKESHA

Engine : H24DS/DSI

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve  
: 1 417 413 025  
  
Inlet press., bar : 1.50  
  
Test nozzle holder  
assembly : 1 688 901 019  
  
Opening  
pressure, bar : 207...210  
  
Orifice plate  
diameter mm : 0,8  
  
Test lines : 1 680 750 067  
  
Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
  
Prestroke mm : 3.60...3.70  
: (3.55...3.75)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 2- 6- 8- 5  
: - 7- 3

Phasing : 0-45-090-135-180-225  
-270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 11.70...11.80

Del. quantity cm<sup>3</sup>/ : 36.8...37.1

100 s : (26.5...37.5)

Spread cm<sup>3</sup> : 0.6

100 s : (1.0)

2nd speed rpm : 350.0

Rack travel in mm : 4.2...4.4

Del. quantity cm<sup>3</sup>/ : 1.5...2.1

100 s : (1.1...2.5)

Spread cm<sup>3</sup> : 1.0

100 s : (1.4)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.50...1.80

2nd speed rpm : 700  
travel mm : 5.30...5.70

3rd speed rpm : 950  
travel mm : 8.40...8.60

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 950

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del. quantity : 368.5...371.5

1000 : (265.0...375.0)

Spread cm<sup>3</sup> : 6.00

1000 : (10.00)

## RATED SPEED

1st version  
Control Lever  
position degrees: 57...65

Testing:  
1st rack travel in: 10.70  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1030...1060  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 5...13

Testing:  
Speed rpm : 100  
Minimum rack trave: 5.80  
Speed rpm : 350  
Rack travel in mm : 4.20...4.40

CONSTANT REGULATION  
Speed rpm : 350...450

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.70  
Speed rpm : 940...950

INTERMEDIATE RATED SPEED  
Rack travel in mm : 4.00

#### STARTING FUEL DELIVERY

Speed rpm : 100

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.20...4.40  
Del.quantity cm<sup>3</sup>/ : 15.0...21.0  
1000 s: (11.0...25.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.00)

Remarks:  
:

#### APPLICATION

Navy

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : WAU 24,0 a1  
 Edition : 17.02.89  
 Replaces : 5.8.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 848  
 Injection pump  
 Pump designation : PE8P130A920/4RS7158  
 EP type number : 0 412 638 801  
 Governor  
 Governor design. : RQ350/925PA892  
 Governor no. : 0 421 801 441

Customer-spec. information  
 Customer : WAUKESHA

Engine : H24DS/DSI

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 067  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 3.60...3.70  
 : (3.55...3.75)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 2- 6- 8- 5  
 - 7- 3

Phasing : 0-45-090-135-180-225  
 -270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900  
 Rack travel in mm : 11.70...11.80  
 Del.quantity cm<sup>3</sup>/ : 36.8...37.1  
 100 s: (36.5...37.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

2nd speed rpm : 350.0  
 Rack travel in mm : 4.2...4.4  
 Del.quantity cm<sup>3</sup>/ : 1.5...2.1  
 100 s: (1.1...2.5)  
 Spread cm<sup>3</sup> : 1.0  
 100 s: (1.4)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 600  
 Rack travel in mm : 15.60...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Del.quantity : 368.5...371.5  
 1000 : (365.0...375.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (10.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 16.0

Testing:  
 1st rack travel in: 10.70  
 Speed rpm : 970...985  
 2nd rack travel in: 4.00  
 Speed rpm : 1040...1070

4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.3

Testing:  
Speed rpm : 100  
Minimum rack trave: 5.80  
Speed rpm : 350  
Rack travel in mm : 4.20...4.40  
Rack travel in mm : 2.00  
Speed rpm : 400...440

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.70  
Speed rpm : 970...985

INTERMEDIATE RATED SPEED  
Rack travel in mm : 4.00

#### STARTING FUEL DELIVERY

Speed rpm : 100

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.20...4.40  
Del.quantity cm<sup>3</sup>/ : 15.0...21.0  
1000 s: (11.0...25.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.00)

Remarks:

:

#### APPLICATION

Navy

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 14,7 o  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 648 855

Injection pump  
 Pump designation : PE8P120A320LS7823  
 EP type number : 0 412 628 835  
 Governor  
 Governor design. : RQV350..1050PA870-5  
 Governor no. : 0 421 813 735

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM442 LA

1st version kW : 353.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

**BASIC SETTING**

1st speed rpm : 600  


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 Rack travel in mm : 13.60...13.80  


---

 Del.quantity cm<sup>3</sup>/ : 23.4...23.7  
 100 s: (23.1...24.0)  


---

 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.9...6.5  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 1.90...2.10  
 2nd speed rpm : 800  
 travel mm : 4.90...5.20  
 3rd speed rpm : 1100  
 travel mm : 7.90...8.30  
 4th speed rpm : 1175  
 travel mm : 9.30...9.90

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1100  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version



Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 234.0...237.0  
1000 : (231.0...240.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 53...61

Testing:  
1st rack travel in: 13.40  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 18...26

Testing:  
Speed rpm : 250  
Minimum rack travel: 8.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.50

#### CONSTANT REGULATION

Speed rpm : 300...500

#### TORQUE CONTROL

Dimension a mm : 0.50  
2nd speed rpm : 1050  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 800  
Rack travel in m: 14.90...15.10

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.60...13.80

#### Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 1050  
Rack travel in m: 13.70...13.90  
3rd pressure hPa : 1350  
Rack travel in m: 14.50...14.70

4th pressure hPa : 1500  
Rack travel in m: 14.80...15.00  
5th pressure hPa : -  
Rack travel in m: 9.90...10.20

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 252.0...256.0  
1000 s: (249.0...259.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 263.0...267.0  
1000 s: (260.0...270.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack travel: 13.40  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 14,7 a11  
 Edition : 03.03.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 648 859

Injection pump  
 Pump designation : PE8P120A320LS7801-1  
 EP type number : 0 412 628 818  
 Governor  
 Governor design. : RQV350...950PA866-4  
 Governor no. : 0 421 813 737

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM442 A

1st version kW : 264.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

**BASIC SETTING**

1st speed rpm : 930  


---

 Rack travel in mm : 15.30...15.40  


---

 Del. quantity cm<sup>3</sup>/ : 20.6...20.8  
 100 s: (20.3...21.1)  


---

 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  


---

2nd speed rpm : 350.0  
 Rack travel in mm : 6.2...6.6  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 1.40...1.60  
 2nd speed rpm : 425  
 travel mm : 2.40...2.60  
 3rd speed rpm : 800  
 travel mm : 5.30...5.60  
 4th speed rpm : 1000  
 travel mm : 7.80...8.20  
 5th speed rpm : 1100  
 travel mm : 9.40...9.90

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1000  
 Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 930  
Aneroid pressure h: 950  
Del. quantity : 206.0...208.0  
1000 : (203.0...211.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 51...59

Testing:  
1st rack travel in: 14.40  
Speed rpm : 980...990  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 18...26

Testing:  
Speed rpm : 250  
Minimum rack travel: 8.00  
Speed rpm : 350  
Rack travel in mm : 6.20...6.40

CONSTANT REGULATION  
Speed rpm : 350...550

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 950  
Rack travel in m: 15.30...15.40  
2nd speed rpm : 800  
Rack travel in m: 16.40...16.60  
3rd speed rpm : 900  
Rack travel in m: 15.90...16.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : -  
Rack travel mm : 10.90...11.30

Measurement  
Speed 1/min : 600

1st pressure hPa : 450

Rack travel in m: 11.70...11.90  
2nd pressure hPa : 700  
Rack travel in m: 13.80...14.00

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 950  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 233.0...237.0  
1000 s: (230.0...240.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 950  
Speed rpm : 930  
Del. quantity cm<sup>3</sup>/ : 167.0...169.0 \*  
1000 s: (164.0...172.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 143.0...145.0  
1000 s: (140.0...148.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.40  
Speed rpm : 980...990

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 190.0...210.0  
1000 s: (186.0...214.0)

Remarks:  
:

\* = Set at reduced-delivery stop.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 18,3 m 1  
 Edition : 07.02.89  
 Replaces : 2.9.88  
 Test oil : ISO-4113

Combination no. : 0 402 649 804

Injection pump  
 Pump designation : PE10P120A320LS7809-1  
 EP type number : 0 412 629 801  
 Governor  
 Governor design. : RQV300..1050PA797-6  
 Governor no. : 0 421 813 705

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM443 A

1st version kW : 331.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 130...150

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 10- 9- 4- 1- 8- 7  
 - 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
 216-261-288-333  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

**BASIC SETTING**

1st speed rpm : 1050

Rack travel in mm : 13.30...13.40

Del.quantity cm<sup>3</sup>/ : 18.7...19.0

100 s: (18.4...19.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.5...6.8  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300  
 travel mm : 1.20...1.40  
 2nd speed rpm : 600  
 travel mm : 4.90...5.20  
 3rd speed rpm : 800  
 travel mm : 5.80...6.20  
 4th speed rpm : 1025  
 travel mm : 8.50...9.00  
 5th speed rpm : 1175  
 travel mm : 9.50...10.10

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1100  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050  
Aneroid pressure h: 900  
Del.quantity : 187.0...190.0  
1000 : (184.0...193.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 53...61

Testing:  
1st rack travel in: 12.30  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 19...27

Testing:  
Speed rpm : 200  
Minimum rack trave: 8.60  
Speed rpm : 300  
Rack travel in mm : 6.50...6.80

CONSTANT REGULATION  
Speed rpm : 300...400

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.30...13.40  
2nd speed rpm : 750  
Rack travel in m: 14.20...14.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.50...11.80

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 12.10...12.30  
2nd pressure hPa : 550

Rack travel in m: 13.50...13.70

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 198.0...202.0  
1000 s: (195.0...205.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 131.0...133.0  
1000 s: (128.0...136.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.30  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 18,3 p  
 Edition : 07.02.89  
 Replaces : 26.8.88  
 Test oil : ISO-4113

Combination no. : 0 402 649 805

Injection pump  
 Pump designation : PE10P120A320LS7817  
 EP type number : 0 412 629 803  
 Governor  
 Governor design. : RQ300/1250PA856-1  
 Governor no. : 0 421 801 449

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM443 LA

1st version kW : 400.0  
 Rated speed : 2500

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 130...150

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 10- 9- 4- 1- 8- 7  
 - 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
 216-261-288-333  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

**BASIC SETTING**

1st speed rpm : 600

Rack travel in mm : 15.50...15.70

Del.quantity cm<sup>3</sup>/ : 22.4...22.6  
 100 s: (22.1...22.9)

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.6...6.8  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1050  
 Del.quantity : 224.0...226.0  
 1000 : (221.0...229.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.40  
Speed rpm : 1295...1310  
2nd rack travel in: 4.00  
Speed rpm : 1390...1420  
4th rack travel in: 1500  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.7

Testing:

Speed rpm : 200  
Minimum rack travel: 8.10  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

2nd speed rpm : 1250  
Rack travel in m: 15.40...15.60  
3rd speed rpm : 800  
Rack travel in m: 16.10...16.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1050  
Rack travel mm : 16.10...16.30

Measurement

Speed 1/min : 600

1st pressure hPa : 400  
Rack travel in m: 13.20...13.40  
2nd pressure hPa : 750  
Rack travel in m: 15.20...15.40  
3rd pressure hPa : 1250  
Rack travel in m: 16.20...16.40  
4th pressure hPa : 1500  
Rack travel in m: 16.60...16.80  
5th pressure hPa : -  
Rack travel in m: 11.50...11.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500  
Speed rpm : 1250  
Del.quantity cm3/ : 222.0...226.0  
1000 s: (219.0...229.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm3/ : 235.0...239.0  
1000 s: (232.0...242.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 129.0...131.0  
1000 s: (126.0...134.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.40  
Speed rpm : 1295...1310

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 230.0...250.0  
1000 s: (226.0...254.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 18,2 d1  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 649 807  
 Injection pump  
 Pump designation : PE10P120A520LS7811  
 EP type number : 0 412 629 802  
 Governor  
 Governor design. : RQV250...1150PA902  
 Governor no. : 0 421 813 720

Customer-spec. information  
 Customer : MAN

Engine : D 2840 LX

1st version kW : 603.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.90...5.00  
 : (4.85...5.05)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 10- 9- 4- 1- 8- 7  
 - 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
 216-261-288-333  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 13.30...13.40

Del. quantity cm<sup>3</sup>/ : 28.4...28.6

100 s: (28.1...28.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 500.0

Rack travel in mm : 8.7...8.9

Del. quantity cm<sup>3</sup>/ : 14.1...14.7

100 s: (13.8...15.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

3rd speed rpm : 250

Rack travel in mm : 7.30...7.50

Del. quantity cm<sup>3</sup>/ : 5.3...6.0 \*\*

100 s: (-)

Spread cm<sup>3</sup> : -

100 s: (-)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 1.10...1.50

2nd speed rpm : 500  
 travel mm : 3.80...4.20

3rd speed rpm : 850  
 travel mm : 8.50...8.90

4th speed rpm : 1150  
 travel mm : 9.50...9.70

5th speed rpm : 1400  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1200



Rack travel in mm : 15.20...17.80

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 1150  
Aneroid pressure h: 1300  
Del.quantity : 284.0...286.0  
1000 : (281.0...289.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 79...87

##### Testing:

1st rack travel in: 12.30  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1345...1375  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 18...26

##### Testing:

Speed rpm : 100  
Minimum rack travel: 8.90  
Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 430...490

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 13.30...13.40

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.10  
2nd pressure hPa : 500  
Rack travel in m: 9.30...9.40  
3rd pressure hPa : 1150  
Rack travel in m: 11.80...12.20

#### START CUT-OUT

Speed 1/min : 200 (220)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 12.30  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0\*\*  
1000 s: (-)

#### HIGH IDLE

##### 1st version

Speed rpm : 500 \*  
Rack travel in mm : 7.20...7.40  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (-)

##### 2nd version

Speed rpm : 500  
Rack travel in mm : 8.00...8.20  
Del.quantity cm<sup>3</sup>/ : 10.0...130.0

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Del.quantity cm<sup>3</sup>/ : 52.0...60.0 \*\*  
1000 s: (-)

#### Remarks:

:

\* applies to cylinders 1, 2, 3, 7 and 9  
\*\* applies for cylinders 4, 5, 6, 8 and 10

#### APPLICATION

Ship

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 18,3 L 2  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 649 808  
 Injection pump  
 Pump designation : PE10P120A320LS7809-1  
 EP type number : 0 412 629 801  
 Governor  
 Governor design. : RQ300/1050PA762-6  
 Governor no. : 0 421 801 471

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM443 A

1st version kW : 331.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 130...150

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 10- 9- 4- 1- 8- 7  
 - 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
 216-261-288-333

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

**BASIC SETTING**

1st speed rpm : 1050

Rack travel in mm : 13.30...13.40

Del.quantity cm3/ : 18.5...18.7

100 s: (18.2...19.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

**1st version**

Speed rpm : 1050

Aneroid pressure h: 900

Del.quantity : 185.0...187.0

1000 : (182.0...190.0)

Spread cm3 : 5.00

1000 : (9.00)

**RATED SPEED**

**1st version**

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.30  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.8

Testing:

Speed rpm : 200  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 6.70...7.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.30...13.40  
2nd speed rpm : 750  
Rack travel in m: 14.20...14.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.50...11.80

Measurement

Speed 1/min : 500  
1st pressure hPa : 300  
Rack travel in m: 12.10...12.30  
2nd pressure hPa : 550  
Rack travel in m: 13.50...13.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 750

Del.quantity cm<sup>3</sup>/ : 202.0...205.0  
1000 s: (199.0...208.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 129.0...131.0  
1000 s: (126.0...134.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (-)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 12.30  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MB 21,9 j 1  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 670 804  
 Injection pump  
 Pump designation : PE12P120A320LS7813-1  
 EP type number : 0 412 620 811  
 Governor  
 Governor design. : RSV350...750POA825-5  
 Governor no. : 0 421 833 277

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM 444 LA

1st version kW : 441.0  
 Rated speed : 1500

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 19.00...21.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 : 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 : 180-225-240-285-300-  
 : 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

**BASIC SETTING**

1st speed rpm : 700

Rack travel in mm : 15.90...16.00

Del.quantity cm3/ : 26.7...26.9

100 s: (26.4...27.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.3

Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.8

100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.40

Governor spring pre-tension

Click setting x : ?

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 700

Del.quantity : 267.0...269.0

1000 : (264.0...272.0)

Spread cm3 : 5.00

1000 : (9.00)

**RATED SPEED**

1st version

Control lever  
position degrees: 20...28

Testing:

1st rack travel in: 14.90  
Speed rpm : 750...755  
2nd rack travel in: 4.00  
Speed rpm : 775...788  
4th rack travel in: 900  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 9...17  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.2  
Speed rpm : 350  
Rack travel in mm : 5.10...5.30

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.10  
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

:

Observe VDT-I-420/120

APPLICATION

Generator

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 21,9 y 3  
 Edition : 09.12.88  
 Replaces : 8.6.88  
 Test oil : ISO-4113

Combination no. : 0 402 670 806

Injection pump  
 Pump designation : PE12P120A320LS7807-2  
 EP type number : 0 412 620 812  
 Governor  
 Governor design. : RSV350..1050POA538  
 Governor no. : 0 421 833 300

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM 444 A

1st version kW : 390.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

**BASIC SETTING**

1st speed rpm : 1030

Rack travel in mm : 12.40...12.50

Del.quantity cm<sup>3</sup>/ : 17.2...17.4

100 s: (16.9...17.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.7...6.0  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1030  
 Aneroid pressure h: 900  
 Del.quantity : 172.0...174.0  
 1000 : (169.0...177.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 36...44

Testing:  
1st rack travel in: 11.40  
Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 14.00  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.8

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.50  
Speed rpm : 350  
Rack travel in mm : 5.70...6.00

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1030  
Rack travel in m: 12.40...12.50  
2nd speed rpm : 950  
Rack travel in m: 12.90...13.10  
3rd speed rpm : 875  
Rack travel in m: 13.40...13.60  
4th speed rpm : 750  
Rack travel in m: 13.90...14.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.60...10.90

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 11.40...11.60  
2nd pressure hPa : 500  
Rack travel in m: 13.00...13.20

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 206.0...210.0  
1000 s: (203.0...213.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.40  
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:  
:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : SCA 9,0 k  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 676 805  
 Injection pump  
 Pump designation : PE6P120A32ORS7138  
 EP type number : 0 412 626 822  
 Governor  
 Governor design. : RSV350...1100P1A512  
 Governor no. : 0 421 833 196

Customer-spec. information  
 Customer : SAAB-SCANIA  
 Engine : DS9 52,53,54,55

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 9.00...12.00

LD9

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700  
 Rack travel in mm : 12.20...12.30  
 Del.quantity cm<sup>3</sup>/ : 16.5...16.7  
 100 s: (16.2...17.0)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 4.5...4.9  
 Del.quantity cm<sup>3</sup>/ : 2.0...2.4  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 6.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Del.quantity : 165.0...167.0  
 1000 : (162.0...170.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 62...70

Testing:  
 1st rack travel in: 11.20  
 Speed rpm : 1140...1150  
 2nd rack travel in: 4.00  
 Speed rpm : 1200...1230



4th rack travel in: 1350  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 26..384  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.1

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 350  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00  
Speed rpm : 445...505

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 163.0...171.0  
1000 s: (161.0...173.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 270.0...320.0  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.50...4.70

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO

L10

diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-12

Start of delivery - engine: 13° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 g  
 Edition : 29.2.88  
 Replaces : 1.9.87  
 Test oil : ISO-4113  
 Combination no. : 0 402 678 802  
 Injection pump  
 Pump designation : PE8P120A320LS7801-1  
 EP type number : 0 412 628 818  
 Governor  
 Governor design. : RSV650...1050POA826  
 Governor no. : 0 421 833 253

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM442A

1st version kW : 234.0  
 Rated speed : 2100  
 2nd version kW : 234.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0.8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1080

Rack travel in mm : 11.60...11.70

Del.quantity cm<sup>3</sup>/ : 16.3...16.5

100 s: (16.0...16.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 650.0  
 Rack travel in mm : 4.1...4.3  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1080  
 Del.quantity : 163.0...165.0  
 1000 : (160.0...168.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 34...42

Testing:  
1st rack travel in: 10.60  
Speed rpm : 1110...1120  
2nd rack travel in: 4.00  
Speed rpm : 1135...1150  
4th rack travel in: 1400  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 18...26  
Setting point w/out bumper spring  
Speed rpm : 650  
Rack travel in mm : 4.2

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 650  
Rack travel in mm : 4.20  
Rack travel in mm : 2.00  
Speed rpm : 650...710

SET IDLE AUXILIARY SPRING  
Speed rpm : 2.00

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1080  
Rack travel in m: 11.60...11.70  
2nd speed rpm : 900  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 1000  
Rack travel in m: 12.40...12.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 202.0...206.0  
1000 s: (199.0...209.0)  
Spread cm<sup>3</sup> : 8.0  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.60  
Speed rpm : 1110...1120

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

Engine-speed difference between 1 mm regulated and control-rod travel 4 mm = 25...35 1/min.

In order to adjust and test the EP combination, set full-load speed regul. at 1110...1120 1/min. Then set speed regul. to 1060...1070 1/min again.

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 14,7 g 1  
Edition : 28.11.88  
Replaces : 2.11.87  
Test oil : ISO-4113

Combination no. : 0 402 678 803

Injection pump  
Pump designation : PE8P120A320LS7801-1  
EP type number : 0 412 628 818  
Governor  
Governor design. : RSV350...750POA825-3  
Governor no. : 0 421 833 260

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM442A

1st version kW : 240.0  
Rated speed : 1500

### TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
                  : (4.15...5.35)  
Rack travel in mm : 9.00...12.00  
Firing order : 8- 7- 2- 6- 3- 5-  
                  4- 1

Phasing : 0-45-90-135-180-225-  
                  270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

### BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 15.10...15.20

Del. quantity cm<sup>3</sup>/ : 23.3...23.5

100 s: (23.0...23.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del. quantity : 233.0...235.0

1000 : (230.0...238.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

### RATED SPEED

1st version

Control lever

position degrees: 24...32

Testing:

1st rack travel in: 14.10  
Speed rpm : 750...755  
2nd rack travel in: 4.00  
Speed rpm : 775...788  
4th rack travel in: 900  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever  
position degrees: 10...18  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.3

Testing:

Speed rpm : 100  
Minimum rack travel: 15.00  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 2.00  
Speed rpm : 350...410

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

2nd speed rpm : 900  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 1000  
Rack travel in m: 12.40...12.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 233.0...239.0  
1000 s: (230.0...242.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 230.0...250.0  
1000 s: (226.0...254.0)

Remarks:

:

APPLICATION

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS

6- 8

Note remarks

Test sheet : SCA 14,2 c2  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 678 807  
 Injection pump  
 Pump designation : PE8P120A920/4LS7002  
 EP type number : 0 412 628 800  
 Governor  
 Governor design. : RSV350...1000P1/484-  
 1  
 Governor no. : 0 421 833 278  
 Customer-spec. information  
 Customer : SAAB-SCANIA

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 2- 7- 3- 4- 5-

L15

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 13.20...13.30  
 Del.quantity cm3/ : 18.7...18.9  
 100 s: (18.4...19.2)  
 Spread cm3 : 0.6  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 4.7...5.2  
 Del.quantity cm3/ : 1.4...1.8  
 100 s: (-)  
 Spread cm3 : 0.3  
 100 s: (0.6)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del.quantity : 187.0...189.0  
 1000 : (184.0...192.0)  
 Spread cm3 : 6.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 55...63

Testing:  
 1st rack travel in: 12.20  
 Speed rpm : 1040...1050  
 2nd rack travel in: 4.00  
 Speed rpm : 1110...1140

4th rack travel in: 1300  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 25...33  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.3

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 440...500

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 184.0...192.0  
1000 s: (182.0...194.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.20  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.70...4.90

Remarks:  
: DS14 06,07  
: DS14 40,42  
: DSI14 40,41

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-21

Start of delivery - engine:  
DS 14 - 18° before TDC  
DSI 14 - 17° before TDC

Engine firing sequence: 1-5-4-2-6-3-7-8

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : SCA 14,0 i  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 678 811  
 Injection pump  
 Pump designation : PE8P120A920/4LS7125  
 EP type number : 0 412 628 833  
 Governor  
 Governor design. : RSV350...1050P1A512-  
 1  
 Governor no. : 0 421 833 306

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS 14

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 2- 7- 3- 4- 5-  
 6- 8

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700

Rack travel in mm : 13.50...13.60

Del.quantity cm<sup>3</sup>/ : 21.4...21.6

100 s: (21.1...21.9)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 4.6...5.0  
 Del.quantity cm<sup>3</sup>/ : 1.5...1.9

100 s: (-)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

**1st version**

Speed rpm : 700

Del.quantity : 214.0...216.0

1000 : (211.0...219.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

**RATED SPEED**

**1st version**

Control lever  
 position degrees: 44...52

**Testing:**

1st rack travel in: 12.50

Speed rpm : 1090...1100



2nd rack travel in: 4.00  
Speed rpm : 1115...1145  
4th rack travel in: 1280  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 14...22  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.2

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 430...490

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 950  
Del. quantity cm<sup>3</sup>/ : 203.0...211.0  
1000 s: (201.0...213.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 12.50  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.60...4.80

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on November 28, 1988

Engine firing sequence: 1-5-4-2-6-3-7-8

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 11,1a11  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 736 800

Injection pump  
 Pump designation : PES6P120A720/3RS7135  
 -1

EP type number : 0 412 726 818  
 Governor  
 Governor design. : RQV325..1050PA848-  
 20K  
 Governor no. : 0 421 815 203

**Customer-spec. information**

Customer : MACK

Engine : EM6 300 2VH

1st version kW : 224.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 9 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

L19

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1050

---

Rack travel in mm : 12.90...13.00

---

Del. quantity cm<sup>3</sup>/ : 19.9...20.1  
 100 s: (19.6...20.4)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.8...5.0  
 Del. quantity cm<sup>3</sup>/ : 3.8...4.4  
 100 s: (3.6...4.6)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

**(B) Setting of injection pump  
 with governor**

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.40...1.60

2nd speed rpm : 450  
 travel mm : 2.50...2.80

3rd speed rpm : 800  
 travel mm : 4.80...5.00

4th speed rpm : 1050  
 travel mm : 7.30...7.60

5th speed rpm : 1200  
 travel mm : 9.40...9.60

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1200

Rack travel in mm : 7.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1050  
Aneroid pressure h: 900  
Del.quantity : 199.0...201.0  
1000 : (196.0...204.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 56...64

#### Testing:

1st rack travel in: 11.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 10...18

#### Testing:

Speed rpm : 275  
Minimum rack travel: 6.30  
Speed rpm : 325  
Rack travel in mm : 4.80...5.00

#### CONSTANT REGULATION

Speed rpm : 325...600

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 630  
Rack travel in m: 13.00...13.10  
3rd speed rpm : 500  
Rack travel in m: 0.00...12.60

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 630  
Pressure hPa : 900  
Rack travel mm : 13.00...13.10

#### Measurement

Speed 1/min : 630

1st pressure hPa : -  
Rack travel in m: 7.80...8.20  
2nd pressure hPa : 190  
Rack travel in m: 9.10...9.20

3rd pressure hPa : 410  
Rack travel in m: 11.40...11.80

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 630  
Del.quantity cm<sup>3</sup>/ : 213.0...219.0  
1000 s: (210.0...222.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 121.0...125.0  
1000 s: (119.0...127.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 110.0...150.0  
1000 s: (100.0...160.0)  
Rack travel in mm : 7.80...8.20

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.80...5.00  
Del.quantity cm<sup>3</sup>/ : 38.0...44.0  
1000 s: (36.0...46.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

#### APPLICATION

Omnibus

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 10,0 o  
 Edition : 03.03.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 745 806  
 Injection pump  
 Pump designation : PES5P120A720LS7163  
 EP type number : 0 412 725 803  
 Governor  
 Governor design. : RQ300/1050PA774-4  
 Governor no. : 0 421 801 453

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM429 LA

1st version kw : 221.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

**BASIC SETTING**

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del.quantity cm<sup>3</sup>/ : 23.5...23.7

100 s: (23.2...24.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.6...5.9  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 600  
 Aneroid pressure h: 800  
 Del.quantity : 235.0...237.0  
 1000 : (232.0...240.0)

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:  
1st rack travel in: 12.00  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 13.00  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.7

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.60  
Speed rpm : 300  
Rack travel in mm : 5.60...5.90  
Rack travel in mm : 2.00  
Speed rpm : 370...410

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.00...13.20  
2nd speed rpm : 750  
Rack travel in m: 14.40...14.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.60...13.80

Measurement  
Speed 1/min : 600  
1st pressure hPa : 200  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 450  
Rack travel in m: 13.00...13.20  
3rd pressure hPa : 1000  
Rack travel in m: 13.70...13.80  
4th pressure hPa : 1400  
Rack travel in m: 14.40...14.60  
5th pressure hPa : -  
Rack travel in m: 10.00...10.40

START CUT-OUT  
Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 1050  
Del.quantity cm3/ : 228.0...231.0  
1000 s: (225.0...234.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1400  
Speed rpm : 750  
Del.quantity cm3/ : 250.0...254.0  
1000 s: (247.0...257.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Speed rpm : 500  
Del.quantity cm3/ : 146.0...148.0  
1000 s: (143.0...151.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.00  
Speed rpm : 1095...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 11,1 a  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113

Combination no. : 0 402 746 810

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA848K  
 Governor no. : 0 421 815 168

Customer-spec. information  
 Customer : MACK

Engine : E6-350 4VH

1st version kW : 261.0  
 Rated speed : 1800

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 900

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 23.6...23.8

100 s: (23.3...24.1)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.0...4.2

Del.quantity cm3/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 3.10...3.30

3rd speed rpm : 850  
 travel mm : 5.90...6.10

4th speed rpm : 1000  
 travel mm : 7.50...7.70

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 7.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 900

Aneroid pressure h: 900

Del.quantity : 236.5...238.5

1000 : (233.5...241.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 53...61

Testing:  
1st rack travel in: 12.90  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 5.50  
Speed rpm : 325  
Rack travel in mm : 4.00...4.20

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 625  
Rack travel in m: 14.10...14.20  
3rd speed rpm : 800  
Rack travel in m: 14.00...14.10  
4th speed rpm : 500  
Rack travel in m: 0.00...13.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 900  
Rack travel mm : 14.10...14.20

Measurement  
Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 275  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 570

Rack travel in m: 12.30...12.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 257.0...263.0  
1000 s: (254.0...266.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 142.0...146.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.90  
Speed rpm : 950...960

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 8.50...8.90

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.00...4.20  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAC 11,1 a1  
 Edition : 07.02.89  
 Replaces : 8.4.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 814  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA848-1K  
 Governor no. : 0 421 815 169

Customer-spec. information  
 Customer : MACK

Engine : E6-300 4VH

1st version kW : 224.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm<sup>3</sup>/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 7.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 200.5...202.5

1000 : (197.5...205.5)



Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 11.90  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 700  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 600  
Rack travel in m: 13.50...13.70  
4th speed rpm : 500  
Rack travel in m: 0.00...13.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.50...13.70

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.90...10.30  
2nd pressure hPa : 250  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 475

Rack travel in m: 12.60...13.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 217.0...223.0  
1000 s: (214.0...226.0)  
Aneroid pressure h: 900  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 233.0...239.0  
1000 s: (230.0...242.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del. quantity cm<sup>3</sup>/ : 154.0...158.0  
1000 s: (152.0...160.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 900...910

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 195.0...235.0  
1000 s: (185.0...245.0)  
Rack travel in mm : 9.90...10.30

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del. quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 11,1 a2  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 815  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA848-2K  
 Governor no. : 0 421 815 170

Customer-spec. information  
 Customer : MACK

Engine : E6-275 4VH

1st version kW : 202.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 850

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 18.1...18.3

100 s: (17.8...18.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1110

Rack travel in mm : 7.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 181.0...183.0

1000 : (178.0...186.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 52...60

Testing:  
1st rack travel in: 11.00  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 600  
Rack travel in m: 12.60...12.70  
3rd speed rpm : 700  
Rack travel in m: 12.50...12.70  
4th speed rpm : 500  
Rack travel in m: 0.00...12.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 12.60...12.70

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.50...9.90  
2nd pressure hPa : 215  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 360

L28

Rack travel in m: 11.50...11.90

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 210.5...216.5  
1000 s: (207.5...219.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 144.0...148.0  
1000 s: (142.0...150.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.00  
Speed rpm : 900...910

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 160.0...200.0  
1000 s: (150.0...210.0)  
Rack travel in mm : 9.50...9.90

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 a3  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 816  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA848-3K  
 Governor no. : 0 421 815 171

Customer-spec. information  
 Customer : MACK

Engine : EM6-250L 4VH

1st version kW : 186.0  
 Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 10.80...10.90

Del. quantity cm<sup>3</sup>/ : 16.3...16.5

100 s: (16.0...16.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del. quantity cm<sup>3</sup>/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.20

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del. quantity : 163.0...165.0

1000 : (160.0...168.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 9.80  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1010...1040  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 510  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 700  
Rack travel in m: 11.60...11.80  
4th speed rpm : 550  
Rack travel in m: 0.00...13.10

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.00...13.20

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 215  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 435

MO2

Rack travel in m: 12.20...12.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 240.0...246.0  
1000 s: (237.0...249.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 146.0...150.0  
1000 s: (144.0...152.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.80  
Speed rpm : 925...935

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...185.0  
1000 s: (135.0...195.0)  
Rack travel in mm : 8.60...9.00

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 11,1 a4  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 746 817  
  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA848-4K  
 Governor no. : 0 421 815 173

Customer-spec. information  
 Customer : MACK

Engine : EC6-350 4VH

1st version kW : 261.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 900

Rack travel in mm : 14.60...14.70

Del.quantity cm3/ : 24.1...24.3

100 s: (23.8...24.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.9...5.1

Del.quantity cm3/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 3.10...3.30

3rd speed rpm : 850  
 travel mm : 5.90...6.10

4th speed rpm : 1000  
 travel mm : 7.50...7.70

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 7.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 241.5...243.5

1000 : (238.5...246.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 53...61

Testing:  
1st rack travel in: 13.60  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1090...1120  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.44  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 14.60...14.70  
2nd speed rpm : 625  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 800  
Rack travel in m: 14.70...14.80  
4th speed rpm : 500  
Rack travel in m: 0.00...14.50

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 1200  
Rack travel mm : 14.90...15.10

Measurement  
Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.10...8.50  
2nd pressure hPa : 280  
Rack travel in m: 10.40...10.50  
3rd pressure hPa : 650

MD4

Rack travel in m: 13.30...13.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 265.0...271.0  
1000 s: (262.0...274.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 130.5...134.5  
1000 s: (128.5...136.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.60  
Speed rpm : 950...960

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...160.0  
1000 s: (110.0...170.0)  
Rack travel in mm : 8.10...8.50

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 a5  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 818  
 Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA848-5K  
 Governor no. : 0 421 815 174

## Customer-spec. information

Customer : MACK  
 Engine : EM6-275L 4VH

1st version kW : 202.0  
 Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 011  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 101  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.20...12.30

Del.quantity cm<sup>3</sup>/ : 19.0...19.2

100 s: (18.7...19.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.6...4.8

Del.quantity cm<sup>3</sup>/ : 3.7...4.3

100 s: (3.5...4.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1110

Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 190.0...192.0

1000 : (187.0...195.0)



Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 11.20  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1030...1060  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 510  
Rack travel in m: 14.10...14.30  
3rd speed rpm : 700  
Rack travel in m: 13.20...13.40  
4th speed rpm : 400  
Rack travel in m: 0.00...13.80

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 14.10...14.30

#### Measurement

Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 280  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 485

Rack travel in m: 12.70...13.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del. quantity cm<sup>3</sup>/ : 262.5...268.5  
1000 s: (259.5...271.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del. quantity cm<sup>3</sup>/ : 145.0...149.0  
1000 s: (143.0...151.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 925...935

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 9.40...9.60

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del. quantity cm<sup>3</sup>/ : 37.0...43.0  
1000 s: (35.0...45.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAC 11,1 a6  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113

Combination no. : 0 402 746 819

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA848-6K  
 Governor no. : 0 421 815 175

Customer-spec. information  
 Customer : MACK

Engine : EM6-225L 4VH

1st version kW : 165.0  
 Rated speed : 1950

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 875

---

Rack travel in mm : 11.00...11.10

---

Del.quantity cm<sup>3</sup>/ : 15.8...16.0  
 100 s: (15.5...16.3)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.6...4.8  
 Del.quantity cm<sup>3</sup>/ : 3.8...4.4  
 100 s: (3.6...4.6)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1110  
 Rack travel in mm : 7.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 900  
 Del.quantity : 158.5...160.5  
 1000 : (155.5...163.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 10.00  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1015...1045  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.00...11.10  
2nd speed rpm : 510  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 600  
Rack travel in m: 12.50...12.70  
4th speed rpm : 700  
Rack travel in m: 11.80...12.00  
5th speed rpm : 350  
Rack travel in m: 0.00...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 900  
Rack travel mm : 13.20...13.40

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 220

M08

Rack travel in m: 9.70...9.80  
3rd pressure hPa : 500  
Rack travel in m: 12.00...12.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 234.0...240.0  
1000 s: (231.0...243.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 131.0...135.0  
1000 s: (129.0...137.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.00  
Speed rpm : 925...935

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (125.0...185.0)  
Rack travel in mm : 8.50...8.90

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del.quantity cm<sup>3</sup>/ : 38.0...44.0  
1000 s: (36.0...46.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 11,1 b5  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 820  
 Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA878K  
 Governor no. : 0 421 815 177

Customer-spec. information  
 Customer : MACK

Engine : E6-275 4VH

1st version kW : 202.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 850

Rack travel in mm : 12.00...12.10

Del.quantity cm3/ : 18.1...18.3

100 s: (17.8...18.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 3.2...3.8  
 100 s: (3.0...4.0)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1110

Rack travel in mm : 7.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 181.0...183.0

1000 : (178.0...186.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 11.00  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 600  
Rack travel in m: 12.60...12.70  
3rd speed rpm : 700  
Rack travel in m: 12.50...12.70  
4th speed rpm : 500  
Rack travel in m: 0.00...12.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 12.60...12.70

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.50...9.90  
2nd pressure hPa : 215  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 360

M10

Rack travel in m: 11.50...11.90

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 210.5...216.5  
1000 s: (207.5...219.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 144.0...148.0  
1000 s: (142.0...150.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
  
full load rack tr: 11.00  
Speed rpm : 900...910

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 160.0...200.0  
1000 s: (150.0...210.0)  
Rack travel in mm : 9.50...9.90

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAC 11,1 b  
 Edition : 07.02.89  
 Replaces : 8.4.88  
 Test oil : ISO-4113

Combination no. : 0 402 746 821

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA878-1K  
 Governor no. : 0 421 815 178

Customer-spec. information  
 Customer : MACK

Engine : E6-300 4VH

1st version kW : 224.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm<sup>3</sup>/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 7.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 200.5...202.5

1000 : (197.5...205.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 11.90  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 700  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 600  
Rack travel in m: 13.50...13.70  
4th speed rpm : 500  
Rack travel in m: 0.00...13.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.50...13.70

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.90...10.30  
2nd pressure hPa : 250  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 475

Rack travel in m: 12.60...13.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 217.0...223.0  
1000 s: (214.0...226.0)  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 233.0...239.0  
1000 s: (230.0...242.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 154.0...158.0  
1000 s: (152.0...160.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 900...910

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 195.0...235.0  
1000 s: (185.0...245.0)  
Rack travel in mm : 9.90...10.30

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAC 11,1 b1  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 822  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA878-2K  
 Governor no. : 0 421 815 179

Customer-spec. information  
 Customer : MACK

Engine : E6-350 4VH

1st version kW : 261.0  
 Rated speed : 1800

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 D08

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 900

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 23.6...23.8

100 s: (23.3...24.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4 0...4.2

Del.quantity cm<sup>3</sup>/ : 3...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 3.10...3.30

3rd speed rpm : 850

travel mm : 5.90...6.10

4th speed rpm : 1000

travel mm : 7.50...7.70

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 7.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 900

Aneroid pressure h: 900

Del.quantity : 236.5...238.5

1000 : (233.5...241.5)



Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 55...63

Testing:  
1st rack travel in: 12.90  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control Lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 5.50  
Speed rpm : 325  
Rack travel in mm : 4.00...4.20

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 625  
Rack travel in m: 14.10...14.20  
3rd speed rpm : 800  
Rack travel in m: 14.00...14.10  
4th speed rpm : 500  
Rack travel in m: 0.00...13.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 900  
Rack travel mm : 14.10...14.20

Measurement  
Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 275  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 570

Rack travel in m: 12.30...12.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 625  
Del.quantity cm3/ : 257.0...263.0  
1000 s: (254.0...266.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 142.0...146.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.90  
Speed rpm : 950...960

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 8.50...8.90

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.00...4.20  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 11,1 b2  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 823  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA878-3K  
 Governor no. : 0 421 815 180

Customer-spec. information  
 Customer : MACK

Engine : EM6-275L 4VH

1st version kW : 202.0  
 Rated speed : 1950

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 875

Rack travel in mm : 12.20...12.30

Del.quantity cm<sup>3</sup>/ : 19.0...19.2

100 s: (18.7...19.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.6...4.8  
 Del.quantity cm<sup>3</sup>/ : 3.7...4.3

100 s: (3.5...4.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1110

Rack travel in mm : 7.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 190.0...192.0

1000 : (187.0...195.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version

Control lever  
position degrees: 52...60

Testing:

1st rack travel in: 11.20  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1030...1060  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 9...17

Testing:

Speed rpm : 275  
Minimum rack travel: 1.50  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 510  
Rack travel in m: 14.10...14.30  
3rd speed rpm : 700  
Rack travel in m: 13.20...13.40  
4th speed rpm : 400  
Rack travel in m: 0.00...13.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 280  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 485

Rack travel in m: 12.70...13.30

#### FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 510  
Del. quantity cm<sup>3</sup>/ : 262.5...268.5  
1000 s: (259.5...271.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del. quantity cm<sup>3</sup>/ : 145.0...149.0  
1000 s: (143.0...151.0)

#### BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 925...935

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 9.40...9.60

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del. quantity cm<sup>3</sup>/ : 37.0...43.0  
1000 s: (35.0...45.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 11,1 b3  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 824  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA878-4K  
 Governor no. : 0 421 815 181

Customer-spec. information  
 Customer : MACK

Engine : EM6-225L 4VH

1st version kW : 165.0  
 Rated speed : 1950

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 875

Rack travel in mm : 11.00...11.10

Del.quantity cm<sup>3</sup>/ : 15.8...16.0

100 s: (15.5...16.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.6...4.8

Del.quantity cm<sup>3</sup>/ : 3.8...4.4

100 s: (3.6...4.6)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1110  
 Rack travel in mm : 7.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 900  
 Del.quantity : 158.5...160.5  
 1000 : (155.5...163.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 10.00  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1015...1045  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.00...11.10  
2nd speed rpm : 510  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 600  
Rack travel in m: 12.50...12.70  
4th speed rpm : 700  
Rack travel in m: 11.80...12.00  
5th speed rpm : 350  
Rack travel in m: 0.00...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 900  
Rack travel mm : 13.20...13.40

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 220

Rack travel in m: 9.70...9.80  
3rd pressure hPa : 500  
Rack travel in m: 12.00...12.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 510  
Del. quantity cm<sup>3</sup>/ : 234.0...240.0  
1000 s: (231.0...243.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del. quantity cm<sup>3</sup>/ : 131.0...135.0  
1000 s: (129.0...137.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.00  
Speed rpm : 925...935

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (125.0...185.0)  
Rack travel in mm : 8.50...8.90

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del. quantity cm<sup>3</sup>/ : 38.0...44.0  
1000 s: (36.0...46.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 11,1 b6  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113

Combination no. : 0 402 746 825

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA878-5K  
 Governor no. : 0 421 815 182

Customer-spec. information  
 Customer : MACK

Engine : EC6-350 4VH

1st version kW : 261.0  
 Rated speed : 1800

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 900

Rack travel in mm : 14.60...14.70

Del.quantity cm<sup>3</sup>/ : 24.1...24.3

100 s: (23.8...24.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.9...5.1

Del.quantity cm<sup>3</sup>/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 3.10...3.30

3rd speed rpm : 850  
 travel mm : 5.90...6.10

4th speed rpm : 1000  
 travel mm : 7.50...7.70

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1130

Rack travel in mm : 7.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 241.5...243.5

1000 : (238.5...246.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 53...61

Testing:  
1st rack travel in: 13.60  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1090...1120  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 1.50  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 14.60...14.70  
2nd speed rpm : 625  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 800  
Rack travel in m: 14.70...14.80  
4th speed rpm : 500  
Rack travel in m: 0.00...14.50

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 1200  
Rack travel mm : 14.90...15.10

#### Measurement

Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.10...8.50  
2nd pressure hPa : 280  
Rack travel in m: 10.40...10.50  
3rd pressure hPa : 650

M20

Rack travel in m: 13.30...13.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 265.0...271.0  
1000 s: (262.0...274.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 130.5...134.5  
1000 s: (128.5...136.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.60  
Speed rpm : 950...960

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...160.0  
1000 s: (110.0...170.0)  
Rack travel in mm : 8.10...8.50

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAC 11,1 b4  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113

Combination no. : 0 402 746 826

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA878-6K  
 Governor no. : 0 421 815 183

Customer-spec. information  
 Customer : MACK

Engine : EM6-250L 4VH

1st version kW : 186.0  
 Rated speed : 1950

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 875

Rack travel in mm : 10.80...10.90

Del.quantity cm<sup>3</sup>/ : 16.3...16.5

100 s: (16.0...16.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.20

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 7.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 163.0...165.0

1000 : (160.0...168.0)



Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 9.80  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1010...1040  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 510  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 700  
Rack travel in m: 11.60...11.80  
4th speed rpm : 550  
Rack travel in m: 0.00...13.10

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.00...13.20

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 215  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 435

M22

Rack travel in m: 12.20...12.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 240.0...246.0  
1000 s: (237.0...249.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 146.0...150.0  
1000 s: (144.0...152.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.80  
Speed rpm : 925...935

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...185.0  
1000 s: (135.0...195.0)  
Rack travel in mm : 8.60...9.00

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 c  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 827  
 Injection pump  
 Pump designation : PES6P120A720RS7148  
 EP type number : 0 412 726 810  
 Governor  
 Governor design. : RQV325...875PA848-7K  
 Governor no. : 0 421 815 176

Customer-spec. information  
 Customer : MACK

Engine : EM6 300L 4VH  
 1st version kW : 224.0  
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 011  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 101  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 6.00...8.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875  
 Rack travel in mm : 11.10...11.20  
 Del. quantity cm<sup>3</sup>/ : 19.9...20.1  
 100 s : (19.6...20.4)  
 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)  
 2nd speed rpm : 325.0  
 Rack travel in mm : 4.5...4.7  
 Del. quantity cm<sup>3</sup>/ : 3.9...4.5  
 100 s : (3.7...4.7)  
 Spread cm<sup>3</sup> : 0.8  
 100 s : (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 2.50...2.80  
 3rd speed rpm : 600  
 travel mm : 4.10...4.30  
 4th speed rpm : 875  
 travel mm : 7.30...7.50  
 5th speed rpm : 1000  
 travel mm : 8.70...9.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1040  
 Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1500

Del.quantity : 199.0...201.0  
1000 : (196.0...204.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 10.10  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1000...1030  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 510  
Rack travel in m: 16.50...16.70  
3rd speed rpm : 700  
Rack travel in m: 13.30...13.50  
4th speed rpm : 600  
Rack travel in m: 15.50...15.70  
5th speed rpm : 450  
Rack travel in m: 0.00...16.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1500  
Rack travel mm : 16.50...16.70

Measurement  
Speed 1/min : 510

1st pressure hPa : -

M24

Rack travel in m: 8.30...8.70  
2nd pressure hPa : 370  
Rack travel in m: 10.70...10.80  
3rd pressure hPa : 710  
Rack travel in m: 14.40...14.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 510  
Del.quantity cm3/ : 299.0...305.0  
1000 s: (296.0...308.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 152.5...156.5  
1000 s: (150.5...158.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...160.0  
1000 s: (135.0...165.0)  
Rack travel in mm : 8.30...8.70

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 11,1 d  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113

Combination no. : 0 402 746 828

Injection pump  
 Pump designation : PES6P120A720RS7148  
 EP type number : 0 412 726 810  
 Governor  
 Governor design. : RQV325...875PA878-7K  
 Governor no. : 0 421 815 184

Customer-spec. information  
 Customer : MACK

Engine : EM6 300L 4VH

1st version kW : 224.0  
 Rated speed : 1950

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 6.00...8.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 875

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 19.9...20.1

100 s: (19.6...20.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.50...2.80

3rd speed rpm : 600  
 travel mm : 4.10...4.30

4th speed rpm : 875  
 travel mm : 7.30...7.50

5th speed rpm : 1000  
 travel mm : 8.70...9.00

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1040

Rack travel in mm : 6.00...12.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 875

Aneroid pressure h: 1500

Del.quantity : 199.0...201.0  
1000 : (196.0...204.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 10.10  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1000...1030  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 510  
Rack travel in m: 16.50...16.70  
3rd speed rpm : 700  
Rack travel in m: 13.30...13.50  
4th speed rpm : 600  
Rack travel in m: 15.50...15.70  
5th speed rpm : 450  
Rack travel in m: 0.00...16.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1500  
Rack travel mm : 16.50...16.70

Measurement  
Speed 1/min : 510

1st pressure hPa : -

M26

Rack travel in m: 8.30...8.70  
2nd pressure hPa : 370  
Rack travel in m: 10.70...10.80  
3rd pressure hPa : 710  
Rack travel in m: 14.40...14.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 510  
Del.quantity cm3/ : 299.0...305.0  
1000 s: (296.0...308.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 152.5...156.5  
1000 s: (150.5...158.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...160.0  
1000 s: (135.0...165.0)  
Rack travel in mm : 8.30...8.70

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 11,1 a7  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113

Combination no. : 0 402 746 829

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325..1050PA848-8K  
 Governor no. : 0 421 815 185

Customer-spec. information  
 Customer : MACK

Engine : E6-270 4VH

1st version kW : 201.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1050

Rack travel in mm : 12.20...12.30

Del. quantity cm<sup>3</sup>/ : 17.4...17.6

100 s: (17.1...17.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.9...5.1

Del. quantity cm<sup>3</sup>/ : 3.8...4.4

100 s: (3.6...4.6)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.40...1.60

2nd speed rpm : 450  
 travel mm : 2.50...2.80

3rd speed rpm : 800  
 travel mm : 4.80...5.00

4th speed rpm : 1050  
 travel mm : 7.30...7.60

5th speed rpm : 1200  
 travel mm : 9.40...9.60

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1210

Rack travel in mm : 7.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1050

Aneroid pressure h: 900

Del.quantity : 174.0...176.0  
1000 : (171.0...179.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.40  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

#### CONSTANT REGULATION

Speed rpm : 325...600

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 630  
Rack travel in m: 12.00...12.20  
3rd speed rpm : 925  
Rack travel in m: 11.90...12.10  
4th speed rpm : 800  
Rack travel in m: 12.20...12.40

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 630  
Pressure hPa : 900  
Rack travel mm : 12.00...12.10

#### Measurement

Speed 1/min : 630

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 270

Rack travel in m: 9.60...9.70  
3rd pressure hPa : 400  
Rack travel in m: 11.00...11.50

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 630  
Del.quantity cm<sup>3</sup>/ : 192.0...198.0  
1000 s: (189.0...201.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 129.0...133.0  
1000 s: (127.0...135.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (125.0...185.0)  
Rack travel in mm : 8.60...9.00

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 38.0...44.0  
1000 s: (36.0...46.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 a8  
Edition : 10.02.89  
Replaces : 6.4.88  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 832  
  
Injection pump  
Pump designation : PES6P120A72ORS7135  
EP type number : 0 412 726 807  
Governor  
Governor design. : RQV325...900PA848-10  
K  
Governor no. : 0 421 815 189

Customer-spec. information  
Customer : MACK

Engine : EM6 275 2VH

1st version kW : 202.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
: (2.70...2.90)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 12.30...12.40

Del. quantity cm<sup>3</sup>/ : 18.7...18.9

100 s : (18.4...19.2)

Spread cm<sup>3</sup> : 0.5

100 s : (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.6...4.8

Del. quantity cm<sup>3</sup>/ : 3.7...4.3

100 s : (3.5...4.5)

Spread cm<sup>3</sup> : 0.8

100 s : (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.20...1.40

2nd speed rpm : 450  
travel mm : 3.10...3.30

3rd speed rpm : 850  
travel mm : 5.90...6.10

4th speed rpm : 1000  
travel mm : 7.50...7.70

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1120

Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 900



Del. quantity : 187.0...189.0  
1000 : (184.0...192.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 51...59

Testing:  
1st rack travel in: 11.30  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1055...1085  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

#### CONSTANT REGULATION

Speed rpm : 325...480

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 12.30...12.40  
2nd speed rpm : 540  
Rack travel in m: 13.40...13.60  
3rd speed rpm : 700  
Rack travel in m: 12.70...12.90  
4th speed rpm : 450  
Rack travel in m: 0.00...13.50

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 540  
Pressure hPa : 900  
Rack travel mm : 13.40...13.60

#### Measurement

Speed 1/min : 540

1st pressure hPa : -  
Rack travel in m: 9.00...9.40  
2nd pressure hPa : 320

Rack travel in m: 10.20...10.30  
3rd pressure hPa : 550  
Rack travel in m: 12.00...12.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 540  
Del. quantity cm<sup>3</sup>/ : 239.0...247.0  
1000 s: (237.0...249.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del. quantity cm<sup>3</sup>/ : 142.0...146.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 950...960

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 150.0...190.0  
1000 s: (140.0...200.0)  
Rack travel in mm : 9.00...9.40

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del. quantity cm<sup>3</sup>/ : 37.0...43.0  
1000 s: (35.0...45.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 11,1 a9  
 Edition : 10.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 833  
 Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...975PA848-11  
 K  
 Governor no. : 0 421 815 190

Customer-spec. information  
 Customer : MACK

Engine : E6-350 2VH

1st version kW : 257.0  
 Rated speed : 1950

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 975

Rack travel in mm : 14.10...14.20

Del.quantity cm<sup>3</sup>/ : 23.0...23.2

100 s: (22.7...23.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.8...4.4

100 s: (3.6...4.6)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.40...1.60

2nd speed rpm : 450  
 travel mm : 2.50...2.80

3rd speed rpm : 800  
 travel mm : 4.80...5.00

4th speed rpm : 1050  
 travel mm : 7.30...7.60

5th speed rpm : 1200  
 travel mm : 9.40...9.60

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1190

Rack travel in mm : 7.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 975

Aneroid pressure h: 900  
Del. quantity : 230.5...232.5  
1000 : (227.5...235.5)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 13.10  
Speed rpm : 1015...1025  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

#### CONSTANT REGULATION

Speed rpm : 325...600

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 975  
Rack travel in m: 14.10...14.20  
2nd speed rpm : 700  
Rack travel in m: 13.70...13.90  
3rd speed rpm : 600  
Rack travel in m: 0.00...13.30

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 700  
Pressure hPa : 900  
Rack travel mm : 13.80...13.90

#### Measurement

Speed 1/min : 700

1st pressure hPa : -  
Rack travel in m: 7.80...8.20  
2nd pressure hPa : 240  
Rack travel in m: 9.30...9.40

3rd pressure hPa : 510  
Rack travel in m: 12.20...12.60

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 237.0...233.0  
1000 s: (224.0...236.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del. quantity cm<sup>3</sup>/ : 125.0...129.0  
1000 s: (123.0...131.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.10  
Speed rpm : 1015...1025

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 110.0...150.0  
1000 s: (100.0...160.0)  
Rack travel in mm : 7.80...8.20

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del. quantity cm<sup>3</sup>/ : 38.0...44.0  
1000 s: (36.0...46.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : UNI 9,5 e  
 Edition : 24.02.89  
 Replaces : 30.9.88  
 Test oil : ISO-4113

Combination no. : 0 402 746 834

Injection pump  
 Pump designation : PES6P120A720RS7154  
 EP type number : 0 412 726 811  
 Governor  
 Governor design. : RQV275...1100PA888K  
 Governor no. : 0 421 815 191

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8460.41.102

1st version kW : 235.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

N05

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1100

Rack travel in mm : 11.60...11.70

Del.quantity cm<sup>3</sup>/ : 21.4...21.6

100 s: (21.1...21.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 4.9...5.1

Del.quantity cm<sup>3</sup>/ : 2.0...2.6

100 s: (1.7...2.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

**(B) Setting of injection pump  
 with governor**

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 275  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 3.10...3.90

3rd speed rpm : 800  
 travel mm : 6.30...6.70

4th speed rpm : 1100  
 travel mm : 9.70...9.90

5th speed rpm : 1200  
 travel mm : 13.00...14.00

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 214.0...216.0  
1000 : (211.0...219.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 53...61

#### Testing:

1st rack travel in: 10.60  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 11...19

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 275  
Rack travel in mm : 4.90...5.10

#### CONSTANT REGULATION

Speed rpm : 280...400

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 1100  
Rack travel in m: 11.60...11.70  
3rd speed rpm : 950  
Rack travel in m: 11.90...12.10  
4th speed rpm : 750  
Rack travel in m: 11.80...12.00  
5th speed rpm : 400  
Rack travel in m: 11.20...11.40

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 850  
Pressure hPa : 1200  
Rack travel mm : 12.00...12.10

#### Measurement

Speed 1/min : 850

1st pressure hPa : -

Rack travel in m: 9.00...9.20  
2nd pressure hPa : 515  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 305  
Rack travel in m: 9.70...9.90

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 850  
Del.quantity cm3/ : 196.0...202.0  
1000 s: (193.0...205.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 127.0...129.0  
1000 s: (124.0...132.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.60  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...150.0  
1000 s: (116.0...154.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PER 12,2 d  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 835  
 Injection pump  
 Pump designation : PES6P120A32ORS7156  
 EP type number : 0 412 726 813  
 Governor  
 Governor design. : RQV250..1050PA793-2  
 Governor no. : 0 421 813 699

Customer-spec. information  
 Customer : PERKINS

Engine : EAGLE TX

1st version kW : 280.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.20...14.30

Del.quantity cm3/ : 27.7...27.9

100 s: (27.4...28.2)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...2.0)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 0.90...1.30

2nd speed rpm : 350

travel mm : 2.90...3.50

3rd speed rpm : 700

travel mm : 4.00...4.60

4th speed rpm : 1000

travel mm : 7.40...7.60

5th speed rpm : 1100

travel mm : 8.80...9.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1070

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del. quantity : 277.0...279.0  
1000 : (274.0...282.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 51...59

#### Testing:

1st rack travel in: 13.20  
Speed rpm : 980...990  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 17...25

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.50  
Speed rpm : 250  
Rack travel in mm : 5.90...6.10

#### CONSTANT REGULATION

Speed rpm : 250...570

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 14.20...14.30

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.20...12.30  
2nd pressure hPa : 850  
Rack travel in m: 13.80...13.90  
3rd pressure hPa : 610  
Rack travel in m: 12.60...12.80

#### START CUT-OUT

Speed 1/min : 170 (190)

#### BREAKAWAY

1st version

NO8

1mm rack travel less than

full load rack tr: 13.20  
Speed rpm : 980...990

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 130.0...170.0  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.90...6.10

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 a  
Edition : 10.02.89  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 836  
  
Injection pump  
Pump designation : PES6P120A720RS7157  
EP type number : 0 412 726 814  
Governor  
Governor design. : RQV325...900PA848-12  
K  
Governor no. : 0 421 815 192

Customer-spec. information  
Customer : MACK

Engine : E7-400 4VH

1st version kW : 298.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
quantity min. 1/h: 160...170

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
: (2.70...2.90)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Phasing :  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900  

---

Rack travel in mm : 15.50...15.60  

---

Del. quantity cm<sup>3</sup>/ : 27.2...27.4  
100 s: (26.9...27.7)  

---

Spread cm<sup>3</sup> : 0.5  

---

100 s: (0.9)

2nd speed rpm : 325.0  
Rack travel in mm : 4.9...5.1  
Del. quantity cm<sup>3</sup>/ : 4.3...4.9  
100 s: (4.1...5.1)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.30...1.60  
2nd speed rpm : 500  
travel mm : 3.40...4.00  
3rd speed rpm : 900  
travel mm : 6.70...6.90  
4th speed rpm : 1075  
travel mm : 8.40...8.90

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1120  
Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 900  
Aneroid pressure h: 1200



Del.quantity : 272.0...274.0  
1000 : (269.0...277.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 56...64

Testing:  
1st rack travel in: 14.50  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1115...1145  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.40  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 325...500

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 15.50...15.60  
2nd speed rpm : 625  
Rack travel in m: 15.30...15.50  
3rd speed rpm : 500  
Rack travel in m: 0.00...14.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 15.50...15.60

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.20...8.60  
2nd pressure hPa : 225  
Rack travel in m: 9.40...9.50  
3rd pressure hPa : 770

N10

Rack travel in m: 13.80...14.20

#### START CUT-OUT

Speed 1/min : 280 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 309.0...315.0  
1000 s: (306.0...318.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 166.0...170.0  
1000 s: (164.0...172.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.50  
Speed rpm : 940...950

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 9.90...10.30

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 43.0...49.0  
1000 s: (41.0...51.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 12,0 a1  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 837  
 Injection pump  
 Pump designation : PES6P120A720RS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...900PA848-15  
 K  
 Governor no. : 0 421 815 193

Customer-spec. information  
 Customer : MACK

Engine : E7-350 4VH

1st version kW : 261.0  
 Rated speed : 1800

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 900

Rack travel in mm : 14.00...14.10

Del.quantity cm3/ : 22.8...23.0  
 100 s: (22.5...23.3)

Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 5.3...5.5  
 Del.quantity cm3/ : 4.1...4.7  
 100 s: (3.9...4.9)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.30...1.60  
 2nd speed rpm : 500  
 travel mm : 3.40...4.00  
 3rd speed rpm : 900  
 travel mm : 6.70...6.90  
 4th speed rpm : 1075  
 travel mm : 8.40...8.90

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1100  
 Rack travel in mm : 7.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 900

Del.quantity : 228.0...230.0  
1000 : (225.0...233.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 56...64

Testing:  
1st rack travel in: 13.00  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1100...1130  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.80  
Speed rpm : 325  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION  
Speed rpm : 325...500

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 625  
Rack travel in m: 13.80...14.00  
3rd speed rpm : 500  
Rack travel in m: 0.00...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 900  
Rack travel mm : 14.00...14.10

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.80...9.20  
2nd pressure hPa : 225  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 545

Rack travel in m: 12.70...13.10

#### START CUT-OUT

Speed 1/min : 265 (275)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 625  
Del.quantity cm3/ : 260.0...266.0  
1000 s: (257.0...269.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 166.0...170.0  
1000 s: (164.0...172.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 950...960

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 10.40...10.80

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 41.0...47.0  
1000 s: (39.0...49.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 12,0 a2  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 838  
 Injection pump  
 Pump designation : PES6P120A720RS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...875PA848-14  
 K  
 Governor no. : 0 421 815 194

Customer-spec. information  
 Customer : MACK

Engine : EM7-250L 4VH

1st version kW : 187.0  
 Rated speed : 1950

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

N13

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 875  
 Rack travel in mm : 10.30...10.40  
 Del. quantity cm<sup>3</sup>/ : 17.3...17.5  
 100 s: (17.0...17.8)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.7...4.9  
 Del. quantity cm<sup>3</sup>/ : 4.1...4.7  
 100 s: (3.9...4.9)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.30...1.60  
 2nd speed rpm : 500  
 travel mm : 3.40...4.00  
 3rd speed rpm : 900  
 travel mm : 6.70...6.90  
 4th speed rpm : 1075  
 travel mm : 8.40...8.90

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1120  
 Rack travel in mm : 6.00...12.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 900

Del.quantity : 173.0...175.0  
1000 : (170.0...178.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 9.30  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1020...1050  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.20  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...500

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 10.30...10.40  
2nd speed rpm : 510  
Rack travel in m: 11.90...12.10  
3rd speed rpm : 450  
Rack travel in m: 0.00...11.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 900  
Rack travel mm : 11.90...12.10

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.30...8.70  
2nd pressure hPa : 205  
Rack travel in m: 9.30...9.40  
3rd pressure hPa : 400

Rack travel in m: 11.00...11.40

#### START CUT-OUT

Speed 1/min : 265 (275)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 510  
Del.quantity cm3/ : 244.0...250.0  
1000 s: (241.0...253.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 168.0...172.0  
1000 s: (166.0...174.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.30  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 9.80...10.20

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm3/ : 41.0...47.0  
1000 s: (39.0...49.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAC 12,0 b  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 839  
 Injection pump  
 Pump designation : PES6P120A720RS7148  
 EP type number : 0 412 726 810  
 Governor  
 Governor design. : RQV325...875PA848-19  
 K  
 Governor no. : 0 421 815 199

Customer-spec. information  
 Customer : MACK

Engine : EM7 300L 4VH

1st version kW : 224.0  
 Rated speed : 1950

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 6.00...8.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 875

Rack travel in mm : 11.50...11.60

Del.quantity cm3/ : 21.0...21.2

100 s: (20.7...21.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 4.1...4.7

100 s: (3.9...4.9)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.50...2.80

3rd speed rpm : 600  
 travel mm : 4.10...4.30

4th speed rpm: : 875  
 travel mm : 7.30...7.50

5th speed rpm : 1000  
 travel mm : 8.70...9.00

**GUIDE SLEEVE POSITION**

Control-Lever position  
 Degree: -1

Speed rpm : 1030

Rack travel in mm : 6.00...12.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 875

Aneroid pressure h: 1200  
Del. quantity : 210.0...212.0  
1000 : (207.0...215.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 57...65

Testing:  
1st rack travel in: 10.50  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1000...1030  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 8...16

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.50...11.60  
2nd speed rpm : 510  
Rack travel in m: 16.00...16.20  
3rd speed rpm : 800  
Rack travel in m: 12.00...12.20  
4th speed rpm : 600  
Rack travel in m: 15.10...15.30  
5th speed rpm : 450  
Rack travel in m: 0.00...15.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 16.00...16.20

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.70...9.10  
2nd pressure hPa : 325  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 815  
Rack travel in m: 14.30...14.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del. quantity cm<sup>3</sup>/ : 294.0...300.0  
1000 s: (291.0...303.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del. quantity cm<sup>3</sup>/ : 166.0...170.0  
1000 s: (164.0...172.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.50  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 165.0...185.0  
1000 s: (155.0...195.0)  
Rack travel in mm : 8.70...9.10

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del. quantity cm<sup>3</sup>/ : 41.0...47.0  
1000 s: (39.0...49.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 11,1a12  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 840  
 Injection pump  
 Pump designation : PES6P120A72DRS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA848-18  
 K  
 Governor no. : 0 421 815 198

Customer-spec. information  
 Customer : MACK

Engine : EMC6 250L 4VH

1st version kW : 187.0  
 Rated speed : 1950

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

N17

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 875

Rack travel in mm : 11.20...11.30

Del.quantity cm<sup>3</sup>/ : 17.3...17.5

100 s: (17.0...17.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 7.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 875

Aneroid pressure h: 1200



Del.quantity : 173.0...175.0  
1000 : (170.0...178.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 54...62

Testing:  
1st rack travel in: 10.20  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1010...1040  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 510  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 700  
Rack travel in m: 12.00...12.20  
4th speed rpm : 450  
Rack travel in m: 0.00...13.10

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.10...13.30

#### Measurement

Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 9.10...9.50  
2nd pressure hPa : 215

Rack travel in m: 10.30...10.40  
3rd pressure hPa : 435  
Rack travel in m: 12.20...12.60

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 239.0...245.0  
1000 s: (236.0...248.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 146.0...150.0  
1000 s: (144.0...152.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...200.0  
1000 s: (150.0...210.0)  
Rack travel in mm : 9.10...9.50

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 12,0 a2  
 Edition : 03.03.89  
 Replaces : 9.9.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 841  
 Injection pump  
 Pump designation : PES6P120A720LS7114-2  
 EP type number : 0 412 726 815  
 Governor  
 Governor design. : RQ300/1050PA774-3  
 Governor no. : 0 421 801 451

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM447 LA

1st version kW : 265.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 600

Rack travel in mm : 14.00...14.20

Del. quantity cm<sup>3</sup>/ : 22.9...23.1

100 s: (22.6...23.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.8...6.2

Del. quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 600

Aneroid pressure h: 1500

Del. quantity : 229.0...231.0

1000 : (226.0...234.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.00  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0  
Speed rpm : 300  
Rack travel in mm : 5.80...6.20  
Rack travel in mm : 2.00  
Speed rpm : 360...400

TORQUE CONTROL

Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 14.00...14.20  
3rd speed rpm : 700  
Rack travel in m: 14.70...14.90

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 14.00...14.20

Measurement

Speed 1/min : 600  
1st pressure hPa : 300  
Rack travel in m: 11.80...12.00  
2nd pressure hPa : 500  
Rack travel in m: 13.40...13.60  
3rd pressure hPa : 1100  
Rack travel in m: 14.20...14.40  
4th pressure hPa : 1500  
Rack travel in m: 14.70...14.90  
5th pressure hPa : -  
Rack travel in m: 10.40...10.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500  
Speed rpm : 1050

Del.quantity cm3/ : 234.0...238.0  
1000 s: (231.0...241.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 700  
Del.quantity cm3/ : 246.0...249.0  
1000 s: (243.0...252.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 146.0...148.0  
1000 s: (143.0...151.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAC 11,1 e  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 842  
 Injection pump  
 Pump designation : PES6P120A72ORS7164  
 EP type number : 0 412 726 816  
 Governor  
 Governor design. : RQV325...875PA848-17  
 K  
 Governor no. : 0 421 815 200  
 Customer-spec. information  
 Customer : MACK  
 Engine : EMC6 300L 4VH  
 1st version kW : 200.0  
 Rated speed : 1950

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 011  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 101  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 11.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 875  
 Rack travel in mm : 14.60...14.70  
 Del.quantity cm<sup>3</sup>/ : 21.9...22.1  
 100 s: (21.6...22.4)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.3...4.5  
 Del.quantity cm<sup>3</sup>/ : 3.9...4.5  
 100 s: (3.7...4.7)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 3.00...3.40  
 3rd speed rpm : 850  
 travel mm : 5.90...6.10  
 4th speed rpm : 1000  
 travel mm : 7.40...7.70

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1120  
 Rack travel in mm : 7.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200

Del.quantity : 219.0...221.0  
1000 : (216.0...224.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 54...62

Testing:  
1st rack travel in: 13.60  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1060...1090  
4th rack travel in: 1160  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 5.80  
Speed rpm : 325  
Rack travel in mm : 4.30...4.50

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 14.60...14.70  
2nd speed rpm : 510  
Rack travel in m: 16.70...16.90  
3rd speed rpm : 700  
Rack travel in m: 15.30...15.50  
4th speed rpm : 600  
Rack travel in m: 16.00...16.20  
5th speed rpm : 420  
Rack travel in m: 0.00...16.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 16.70...16.90

Measurement  
Speed 1/min : 510

1st pressure hPa : -

Rack travel in m: 10.40...10.80  
2nd pressure hPa : 375  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 735  
Rack travel in m: 15.10...15.50

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 304.0...310.0  
1000 s: (301.0...313.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 156.0...160.0  
1000 s: (154.0...162.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.60  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 160.0...200.0  
1000 s: (150.0...210.0)  
Rack travel in mm : 10.40...10.80

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.30...4.50  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER 12,2 e  
Edition : 27.10.88  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 746 844  
Injection pump  
Pump designation : PES6P120A72ORS7162  
EP type number : 0 412 726 819  
Governor  
Governor design. : RQ750PA836-1  
Governor no. : 0 421 801 454

Customer-spec. information  
Customer : PERKINS

Engine : 2006 TAG

1st version kW : 280.0  
Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
                  : (4.45...4.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 37.9...38.1

100 s: (37.6...38.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.5...5.7

Del.quantity cm3/ : 3.8...4.4

100 s: (3.5...4.7)

Spread cm3 : 0.8

100 s: (1.2)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Del.quantity : 379.0...381.0  
1000 : (376.0...384.0)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED

### 1st version

Testing:  
1st rack travel in: 12.00  
Speed rpm : 750...755  
2nd rack travel in: 4.00  
Speed rpm : 785...795  
4th rack travel in: 820  
Speed rpm : 0.00...1.00

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.00

Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 300.0...340.0  
1000 s: (296.0...344.0)

Remarks:

:

APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 16,0 a  
Edition : 17.02.89  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 748 802

Injection pump  
Pump designation : PES8P120A920/4LS7159  
EP type number : 0 412 728 801  
Governor  
Governor design. : RQV325..1050PA848-21  
K  
Governor no. : 0 421 815 201

Customer-spec. information  
Customer : MACK

Engine : EE9 502

1st version kW : 368.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
quantity min. 1/h: 160...170

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

N25

Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65  
                  : (3.50...3.70)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 2- 7- 8- 4- 5-  
                  6- 3

Phasing : 0-45-90-135-180-225-  
                  270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 630

Rack travel in mm : 12.10...12.20

Del. quantity cm<sup>3</sup>/ : 21.5...21.7  
100 s: (21.2...22.0)

Spread cm<sup>3</sup> : 0.5  
100 s: (0.9)

2nd speed rpm : 325.0  
Rack travel in mm : 4.8...5.0  
Del. quantity cm<sup>3</sup>/ : 4.0...4.6  
100 s: (3.8...4.8)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.30...1.60  
2nd speed rpm : 450  
travel mm : 2.30...2.70  
3rd speed rpm : 800  
travel mm : 4.40...4.80  
4th speed rpm : 1050  
travel mm : 6.90...7.10  
5th speed rpm : 1200  
travel mm : 8.90...9.20

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1220  
Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP



1st version

Speed rpm : 630  
Aneroid pressure h: 1200  
Del.quantity : 215.0...217.0  
1000 : (212.0...220.0)  
Spread cm3 : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 57...65

Testing:

1st rack travel in: 12.40  
Speed rpm : 1095...1105  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 9...17

Testing:

Speed rpm : 275  
Minimum rack trave: 6.30  
Speed rpm : 325  
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

Speed rpm : 325...600

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 630  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 1050  
Rack travel in m: 13.40...13.60  
3rd speed rpm : 500  
Rack travel in m: 0.00...11.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1050  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.60

Measurement

Speed 1/min : 1050

1st pressure hPa : -  
Rack travel in m: 8.70...9.10

N26

2nd pressure hPa : 345  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 725  
Rack travel in m: 12.30...12.70

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm3/ : 206.0...212.0  
1000 s: (203.0...215.0)  
Spread cm3 : 10.00  
1000 s: (14.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 161.0...165.0  
1000 s: (159.0...167.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 12.40  
Speed rpm : 1095...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 145.0...185.0  
1000 s: (135.0...195.0)  
Rack travel in mm : 9.60...10.00

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.80...5.00  
Del.quantity cm3/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 10,0 p  
 Edition : 03.03.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 775 800  
 Injection pump  
 Pump designation : PES5P120A720LS7171  
 EP type number : 0 412 725 804  
 Governor  
 Governor design. : RSV350..1050POA529-4  
 Governor no. : 0 421 833 319

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM449 A

1st version kW : 184.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

**BASIC SETTING**

1st speed rpm : 1030

Rack travel in mm : 14.40...14.50

Del.quantity cm<sup>3</sup>/ : 20.9...21.1

100 s: (20.6...21.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.5...4.8

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1030

Aneroid pressure h: 1200

Del.quantity : 209.0...211.0

1000 : (206.0...214.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

**RATED SPEED**

1st version

Control lever  
position degrees: 50...58

Testing:

1st rack travel in: 13.40  
Speed rpm : 1080...1090  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 24...32  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.6  
Speed rpm : 350  
Rack travel in mm : 4.50...4.80

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1030  
Rack travel in m: 14.40...14.50  
2nd speed rpm : 850  
Rack travel in m: 14.70...14.90  
3rd speed rpm : 950  
Rack travel in m: 14.60...14.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 600  
Rack travel mm : 14.00...14.20

Measurement

Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 12.20...12.40  
2nd pressure hPa : 350  
Rack travel in m: 13.30...13.50  
3rd pressure hPa : 800  
Rack travel in m: 14.20...14.40  
4th pressure hPa : 1200  
Rack travel in m: 14.70...14.90  
5th pressure hPa : -  
Rack travel in m: 11.30...11.70

FUEL DELIVERY CHARACTERISTICS

1st version

N28

Aneroid pressure h: 660  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 196.0...199.0  
1000 s: (193.0...202.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.)  
Aneroid pressure h: 1200  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 221.0...223.0  
1000 s: (218.0...226.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 146.0...148.0  
1000 s: (143.0...151.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 1080...1090

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm